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THE SYDNEY FUNNEL-WEB SPIDER (*ATRAX ROBUSTUS*): I. COLLECTION OF VENOM AND ITS TOXICITY IN ANIMALS.

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In Australia there are eight species of spiders of the genus *Atrax*, all of which must be regarded as potentially dangerous to man. Severe illness and death have so far been recorded only from bites of *A. robustus* and *A. formidabilis*.

Because of the difficulty in obtaining material, no laboratory studies have been carried out with *A. formidabilis*, and relatively few experiments have been performed with *A. robustus*. Previous investigators reported either failure or difficulties in demonstrating that the venom of *A. robustus* was toxic to laboratory animals. Kellaway (1933) was unable to demonstrate any toxic effects when *A. robustus* was permitted to bite mice and guinea-pigs, whilst venom collected by inducing spiders to bite small rolls of filter paper produced no effects when injected into a rabbit. Kellaway postulated that the rabbit, guinea-pig and mouse are all insusceptible to the venom of *A. robustus*. In support of Kellaway's theory, Mackerras (1934) reported the death of only one out of three guinea-pigs which were bitten by *A. robustus*; but as neither the

signs before death nor the post-mortem findings were distinctive, he attributed the cause of death to the feeble state of health in which the guinea-pig was before the bite. Wallace and Sticka (1955) reported almost complete inability to obtain toxic reactions when venom collected from *A. robustus* was injected into rats, mice and guinea-pigs. However, in the case of one mouse bitten several times by a funnel-web spider, they observed toxic effects from which the animal recovered in about two hours. They postulated that captivity either has an adverse effect on the toxin-producing properties of *Atrax* or that the toxin becomes concentrated and dangerous only at certain specific periods or under special conditions. Ingram (1956) observed that in a considerable series of animal bites no uniformity of results could be obtained, but that the male spider killed young guinea-pigs in about 30 minutes, whilst poor results were obtained with mice.

Further investigation of the toxicity of the venom of *A. robustus* on laboratory animals appeared desirable for two reasons. First, it was considered remarkable that the bite of a spider which could kill a man should have little effect on a mouse. Secondly, for the purpose of producing antivenene and of studying the effectiveness of other forms of therapy, a suitable method had first to be found for assaying the toxicity of the venom of this spider in animals. In order to determine which species of animals were susceptible to the venom of *A. robustus*, the effects of a bite by this spider were first observed. Subsequently, the lethal dose of venom was determined by

injecting different amounts of venom into susceptible animals.

Source and Transport of Spiders.

A. robustus occurs mainly around Sydney, and with the assistance of local residents a sufficient number of spiders was obtained for experimental purposes.

These were sent to Melbourne by air in screw-capped perforated plastic jars measuring 2.0 inches by 2.5 inches. Only one spider was placed in each jar. A strip of cotton-wool was glued inside the jar to give the spider a foothold during transport. By exerting some attraction on the spider, the cotton-wool also facilitated transfer of the spider into the jar after capture. Moistening the cotton-wool with water provided the necessary humidity.

Of the 1180 spiders sent to us from Sydney as *A. robustus*, 151 belonged to different genera or families, and 470 were dead on arrival. Only 45 male spiders were received, of which 13 were dead on arrival. Injury sustained during capture or transport may have been responsible for such high mortality. In the laboratory, death of a spider was an unusual event.

Macroscopically, *A. robustus* can be distinguished from similar looking spiders by the following features (Figure 1): (a) long spinnerets with terminal segment longest; (b) precurved groove on dorsal aspect of thorax; (c) shiny black colour of dorsal aspect of thorax, reddish-brown colour of ventral aspect; (d) on distal segments of legs scattered coarse hairs; no brush border.

In addition, the male spider can be recognized by the presence of a tibial spur on each of the second pair of legs and by the modification of the palpi ("feelers") into sex organs (Figure 2). In some female specimens the colour of the thorax and legs was reddish-brown, in marked contrast to the jet-black colour of the chelicerae. Excluding the latter, the body of an adult male is about one inch long and that of a female about one and a half inches. With its legs included a spider may be three inches long.

Behaviour in Captivity.

In the laboratory, each spider was kept in a screw-capped glass jar containing a layer of moist soil. They were stored in cardboard boxes on wooden shelves on a balcony.

At first no food was given, and the spiders remained alive and active for several months. When "milking" for venom was instituted, spiders were fed at irregular intervals with *Drosophila*.

In a moist and cool atmosphere it was unusual for spiders to die during their stay in the laboratory. It was generally the very large specimens which died.

On several occasions a spider in its jar was put at 37° C. overnight. In each instance the spider was dead the next morning. Exposure to 4° C. for one week was tolerated without any apparent ill effects. During the colder months of the year the spiders frequently surrounded themselves with a bag-like cover of silk.

Inside the jars the spiders made webs which varied from a simple mat on top of the soil to elaborate funnel-shaped constructions which almost filled the glass jar. The spiders often made small depressions or holes, lined with silk, in the soil touching the side wall of the jar. They would rest in these with the front part of the body pointing downwards, whilst the hind part of the abdomen pointed upwards. At other times, two holes with an intervening bridge of soil were made. Healthy spiders frequently carried a number of mites on their bodies.

In the resting state the spider is motionless, with its legs flexed. If touched, especially if this is accompanied by blowing on it, the spider will immediately assume a fighting position. In this stance the spider stands on its last two pairs of legs, with the abdomen and thorax inclined forwards and upwards, whilst the lower part of the abdomen rests on the ground. The front legs are open and almost vertical, and the chelicerae are erect and

divergent. Drops of clear venom, acid to litmus paper, may be present on the surface of the fangs, which are continuously being flexed and extended. In this position the spider will strike down at any moving object, and at the same time attempt to grasp the object with its front legs. Male spiders are particularly aggressive and are almost tireless in their efforts to attack any moving object.

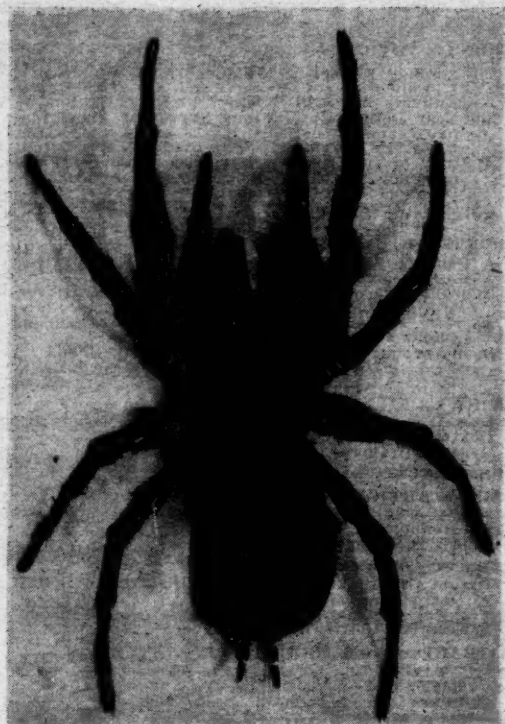


FIGURE 1.
Female *Atrax robustus* (x 1½).

During the "milking" for venom, which will be described later, it was observed that after a spider had yielded an appreciable amount of venom it had lost its aggressiveness and tried to burrow in the soil. The spiders made no attempt to leave the jar when it was opened. Only once during "milking" and once during a biting experiment did a spider escape and cause anxiety until recaptured.

Two types of bites were observed. In the "superficial bite" the spider inserted part of its fangs once or repeatedly for a few seconds, and made little attempt to clasp the object with its legs. In the "deep bite" the spider inserted its fangs right down to their base, so that the lower border of the chelicerae was resting on the surface of the bitten area. At the same time the legs of the spider clasped the object firmly. Whilst this type of bite was in progress considerable force had to be exerted to separate the spider from the bitten object. It was later observed in animals that either type of bite could produce signs of envenomation and death.

The secretion of venom appeared to be under the "voluntary" control of the spider. On many occasions it was observed that a drop of venom visible on the tip of a fang was sucked back into the cavity of the fang. On other occasions it was observed that if the spider crossed its fangs, drops of venom on opposite fangs would coalesce, and then either be sucked back or left on one fang. Drops of venom seldom fell off the fangs during the violent downward thrusts which the spider made when striking.

Effect of Bite.

The simplest method of studying the effect of venom was to let a spider bite an animal and observe the result.

In this type of experiment several aspects require attention. In the case of *A. robustus*, a successful bite can take place only if the spider has adequate room for

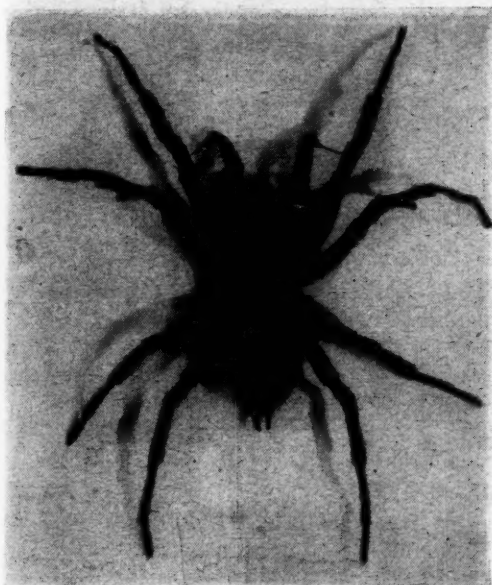


FIGURE II.
Male *Atrax robustus* (x 1½).

striking, since its fangs are used in the manner of an axe. This is unlike the red-back spider (*Latrodectus hasseltii*), whose fangs open and shut like a pair of pincers. For this reason, and also because of the difficulty in handling this aggressive spider, the immobilized part of the animal to be bitten had to be presented to the spider. This is also unlike the procedure used with *L. hasseltii*, where the spider was applied to the animal.

After a spider has bitten an animal there can be no certainty that any venom has been injected. No definite conclusions can, therefore, be drawn from a few experiments giving negative results.

If toxic manifestations do occur which indicate that venom has been injected, neither the amount of venom that has produced them nor its route of injection is known. In several successful biting experiments death occurred so rapidly that only an intravascular injection of venom could have explained it. In another experiment, a young chicken bitten in the head was dead within ten seconds of the bite. Post-mortem examination showed that the fangs had actually penetrated the skull of the chicken. In this connexion one may recall the observation of J. Henri Fabre (1907) that the black-bellied tarantula (*Lycosa tarantula*) will regularly strike at the neck region of an insect when instantaneous death is desired. The venom of *A. robustus* is particularly lethal when injected intracerebrally, as will be seen below.

At the beginning of our "biting" experiments, which were commenced in April, 1956, mice appeared completely resistant. Only in young chickens could an occasional death be produced. In these early experiments only female spiders were used. One out of two rhesus monkeys bitten on the foot by a female *A. robustus* in June became comatose one and a half hours after the bite and died thirty-six hours later. The other monkey suffered no ill effects. Two rats and one cat, each bitten by one funnel-web spider,

showed no effects. Rabbits weighing about two kilograms appeared to be quite unaffected by a bite.

As more experience was gained in the conduct of this type of experiment it was found that young mice and guinea-pigs died fairly regularly after the bite of a male spider, whilst only about one out of five animals died after the bite of a female spider. Table I shows the results

TABLE I.
Mortality After a Bite by *Atrax Robustus*.

Animal.	Sex of Spider.	Number of Animals Bitten.	Number Died.	Times of Death in Minutes.	Mortality. (Percentage.)
Mouse. (Weight: 15 grammes.)	Male.	12	9	6, 7, 10, 12, 16, 23, 65, 65; 48 hours.	75
	Female.	9	2	2, 30.	22
Guinea-pig. (Weight: 150 grammes.)	Male.	12	11	4, 11, 15, 25, 40, 40, 45, 55, 60, 110; 24 hours.	91
	Female.	11	2	24 hours, 48 hours.	18
Chicken. (Age: 10 days.)	Male.	7	3	3, 15, 24 hours.	42
	Female.	12	5	8, 15, 58, 65, 200.	41

of one of a series of such experiments which were carried out during the month of September. Although not strictly comparable, the results of a series of biting experiments on chickens, which were carried out in June, are included in Table I. Guinea-pigs and chickens were bitten in their legs, whilst mice were bitten in the lower part of their back. It can be seen from Table I that the mortality in mice and guinea-pigs was considerably higher after a male bite than after a female bite. However, where death followed the bite of either a male or a female spider, the preceding signs of envenomation were the same.

After a considerable number of "biting" experiments, it was found impossible to predict whether or not signs of envenomation, not to mention death, would follow a bite. In many cases, in which venom was visible on the fangs and the spider sank its fangs deeply into a susceptible animal for thirty seconds or more, no effects were produced. In the case of male spiders a rapid superficial insertion and withdrawal of the fangs would frequently result in a fatal issue.

In general, susceptible animals which showed signs of envenomation after a bite either died or completely recovered within a few hours afterwards. There was a noticeable absence of any such delayed effects as follow red-back spider bites, after which animals may be sick and paralysed for several days before death ensues.

In mammals, a successful bite of *A. robustus* produced several or all of the following signs: crying when bitten, restlessness, profuse watery discharge from mouth and nose, tears and closure of eyes, marked respiratory distress, tremors, incoordination, paralysis of extremities, convulsions and coma. Death was heralded by cessation of respiration, which was followed a few minutes later by cardiac arrest.

In animals which showed signs of intoxication, the body temperature was generally reduced. In cases which ended fatally, a rectal temperature of 80° F. was not uncommon.

In a monkey which eventually died, the whole skin performed undulating worm-like movements forty minutes after a bite.

In guinea-pigs, repeated sneezing and chewing movements, as observed in anaphylaxis, were the first signs of envenomation. Vomiting was also common.

In both mice and guinea-pigs, milky tears were produced occasionally. Microscopic examination showed the fluid to consist of fat droplets which stained red with Sudan III. In these animals, shortly before death, and also for a few

minutes after cessation of respiration, their whiskers and hairs around the face moved continuously as a result of contractions of the underlying skin.

Post-mortem examination generally showed involvement of the lungs. In guinea-pigs, the lungs were congested and emphysematous with hemorrhagic areas on the surface. Frothy fluid exuded when the lungs were cut. The auricles and large veins were distended, and the blood was of a dark colour. The blood clotted normally, and there was no hemolysis in the supernatant serum of a centrifuged specimen.

In mice, the lungs were generally emphysematous and occasionally hemorrhagic.

Examination of a section of the lung of a rhesus monkey which died after a bite showed areas of emphysema, hemorrhages and oedema.

Method of Obtaining Venom.

In order to obtain venom from *A. robustus*, either the venom glands were dissected or the venom was collected from the fangs.

The venom glands, of which there are two in each spider, lie along the medial border of the chelicerae (Figure III). Each gland is curved and flask-shaped (Figure IV); the body of the gland is about five millimetres long and tapers towards the thorax, whilst distally it continues as a duct which measures about 3.5 by 0.5 millimetres. The duct continues inside the fang and opens at a minute slit dorsally above the tip of the fang. The walls of the gland are translucent and easily ruptured during dissection. Examination of a stained section of a venom gland showed that a thin spiral of striped muscle surrounded the connective tissue membrane, on which several layers of epithelial cells were resting and projecting into the lumen of the gland. When a dissected gland was transferred into water one could occasionally observe spurts of fluid discharge from the opening of the duct as the body of the gland contracted. As judged by the fullness of the venom glands, there was considerable variation in the amount of venom contained in each gland. The larger the spider, the bigger were its venom glands.

On the average, about 0.015 cubic millimetre of venom could be aspirated from a full venom gland of an adult spider. The total amount of freeze-dried venom obtained per spider depended on the size of the spider and the state of fullness of the venom glands. Table II shows the yields of venom obtained from different batches of venom glands of adult spiders. In these batches the average amount of venom obtained per female spider varied between 1.0 milligramme and 2.3 milligrammes. However, as not all the venom glands of each batch were equally full, individual spiders no doubt had more than 2.3 milligrammes of venom. In addition, in the earlier batches, venom was lost owing to rupture of some of the venom glands during dissection.

An alternative method for obtaining venom, which did not entail the sacrifice of spiders, involved the aspiration of venom from the tips of the fangs. A glass pipette with a fine tip or a hypodermic needle and syringe were used. Blowing on the spider was effective in making droplets of venom appear on the fangs. Excluding spiders which yielded no venom, the amount of venom obtained in this way from over 500 spiders corresponded to about 0.14 milligramme of venom per milking (Table II). However, variation in the amount of venom obtained was considerable, and individual spiders have yielded up to 0.6 milligramme of dried venom.

Distilled water was used as the diluent or extracting fluid, whether venom was collected by "milking" or by dissecting the venom glands. In the former case, the solution remained clear, whilst an extract of venom glands produced a turbid solution which required to be centrifuged. The clear extract was freeze-dried and a white deliquescent material was obtained which readily dissolved in normal saline.

Whenever venom was required immediately and for immunizing animals, the venom glands were extracted in

normal saline without subsequent freeze-drying. In this case the strength of the resulting extract was expressed in terms of fractions or multiples of a spider, as in the case of venom extracts of *L. hasseltii* (Wiener, 1956a).

Unless otherwise stated, the experiments recorded below were carried out with venom collected from the fangs of female spiders.



FIGURE III.
Chelicerae of *Atrax robustus* with venom gland exposed on one side (x 11).

Toxicity of Venom Injected into Animals.

The subcutaneous or intravascular injection of toxic amounts of venom in mice and guinea-pigs produced effects which were similar to those following a bite by *A. robustus*.

The lethal dose of venom depended on the route of injection. It was smallest if injected intracerebrally. The median lethal doses of venom for mice by the intracerebral, intravenous and subcutaneous routes were approximately in the ratio of 1:80:260.

Within a few hours after the intracerebral injection of venom into mice the majority of animals had either recovered or died. When large amounts of venom were injected, the animals either expired before coming out of the anaesthetic or ran around wildly in their cage for several minutes until death occurred. In the latter case the mouths of the animals were covered with fluid which was frequently blood-stained. The median lethal dose of venom collected from the fangs of female spiders and injected into 129 mice by the intracerebral route was 0.0045 milligramme with a standard error of 11%.

The median lethal dose in mice by the intravenous and subcutaneous routes was 0.35 milligramme and 1.2 milligrammes of venom respectively.

Because of shortage of venom only a few experiments have been carried out on guinea-pigs. The median lethal dose of venom injected intracardially into guinea-pigs varied between 1.0 milligramme and 1.5 milligrammes per

animal weighing 200 grammes, whilst 0.5 milligramme by the same route produced severe signs of envenomation from which the animals recovered a few hours later. The subcutaneous injection of 2.2 milligrammes of venom failed to kill a guinea-pig, although signs of intoxication, with a rectal temperature of 86° F., were present for two hours after the injection; 2.5 to 3.0 milligrammes of venom were required to kill a guinea-pig by the subcutaneous route.

On one occasion two millilitres of blood were removed *post mortem* from a guinea-pig which had died after an intravenous injection of venom. The blood clotted in one

venom or if their venom was more toxic than the venom of female spiders.

Despite the greater "wanderlust" of male spiders, which leads them to enter homes and articles of clothing, relatively few males were amongst the spiders sent to us.

During the month of November, twelve male spiders were anaesthetized and their venom glands dissected. The chelicerae of the adult male spider are shorter and only half as wide as those of the adult female, as can be seen from Figures I and II. The venom glands of the male

TABLE II.
Venom Yields of *Atrax robustus*.

Method of Collecting Venom.	Date.	Number of Spiders.	Freeze-Dried Weight of Venom in Milligrammes.	Venom per Spider in Milligrammes.
Dissection of venom glands.	24. 5.56	5 females.	4.9	0.98
	18. 6.56	6 females.	8.6	1.43
	28. 6.56	6 females.	6.8	1.13
	15. 8.56	10 females.	22.7	2.27
	17.10.56	10 females.	23.4	2.34
	6.11.56	10 females.	19.3	1.93
	20.11.56	10 females.	19.6	1.96
	Total	57 females.	105.3	1.84
	6.11.56	12 males.	12.1	1.01
	Total	69 spiders.	117.4	1.69
"Milking."	11. 7.56	25 females.	3.6	0.14
	19. 7.56	36 females.	5.8	0.16
	10.10.56	123 females.	22.3	0.18
	17.10.56	106 females.	11.0	0.10
	25.10.56	99 females.	9.6	0.09
	1.11.56	103 females.	11.8	0.11
	20.11.56	73 females.	16.2	0.22
	Total	565 females.	80.3	0.14



FIGURE IV.

Venom glands of *Atrax robustus* ($\times 11$).

minute and was then centrifuged. The supernatant serum, which showed no haemolysis, was injected into another guinea-pig. No observable adverse effects were produced.

In view of the previous observation (Wiener and Drummond, 1956) that red-back spider venom and its antivenene can be assayed in *Drosophila*, the same method was also used for assaying the toxicity of the venom of *A. robustus*. It can be seen from Table III that 0.9×10^{-4} milligramme of venom constituted the LD50 dose for *Drosophila*. With the higher concentrations of venom, the insects did not recover from the anaesthetic. With lower concentrations of venom the insects were paralysed with twitchings of their legs. In these cases, after twenty-four hours, some of the paralysed insects had completely recovered. Results were recorded twenty-four hours after the injection.

Toxicity of "Male" Venom.

All the injection experiments hitherto described have been carried out with the venom obtained from *A. robustus* of the female sex as determined by their external anatomy.

In view of the previous finding that in animals the mortality from the bite of a male spider was considerably higher than that following the bite of a female, it became interesting to determine if male spiders contained more

spider were also not as big as those of the female. After extraction of the venom in the usual manner, the resulting material was freeze-dried; 12.1 milligrammes of venom were thus obtained, which corresponded to about one milligramme per male spider.

On the same day the venom glands of 10 female spiders were extracted and 19.3 milligrammes of freeze-dried venom obtained.

The toxicity of both lots of venom was then assayed by various routes in mice and guinea-pigs. From Table IV it can be seen that whatever the route of administration, the venom of the male spider was several times more toxic than the venom of the female.

TABLE III.
Assay of Venom in *Drosophila*.

Amount of Venom Injected in Milligrammes ($\times 10^{-4}$).	Number of Insects.	Number Dead 24 Hours Later.
15.0	5	5
7.5	5	5
3.7	5	5
1.9	5	5
0.9	5	4
0.5	5	1
0.2	5	0
0.1	5	1
0.06	5	0
Normal saline	10	0

After the subcutaneous or intravenous injection of toxic amounts of male venom into mice, signs of envenomation with paralysis of the hind limbs were occasionally prolonged for twenty-four hours before death occurred.

Discussion.

In three of the five fatal human cases which followed a bite by *A. robustus*, the spiders were identified as

males. In the other two cases the sex of the spider remained unknown (Musgrave, 1949). Although cases of bites by female funnel-web spiders have occurred, it is not known whether the bite of a female spider has ever caused death in man.

Most bites by *A. robustus*, and all fatalities, have occurred between the months of November and March. It is probable that this seasonal incidence is related to the greater activity of spiders during summer, which brings

TABLE IV.
Median Lethal Doses of Venom of Male and Female *Atrax Robustus* by Different Routes of Injection.

Animal.	Route of Injection.	Median Lethal Dose of Venom in Milligrammes.	
		"Male" Venom.	"Female" Venom.
Mouse.	Intracerebral.	0.00054 to 0.0011	0.003 to 0.006
	Intravenous.	Less than 0.12	0.3 to 0.4
	Subcutaneous.	0.15 to 0.2	0.9 to 1.6
Guinea-pig.	Intravenous.	0.12 to 0.24	0.8 to 1.2
	Subcutaneous.	0.5 to 0.7	2.1 to 2.6

them in contact with man. Bites by *L. hasseltii* are also most common during summer; nevertheless, the toxicity of its venom for laboratory animals remained the same in every month of one year. It is also possible that, as with other spiders (Bücherl, 1953; Wiener, 1956b), *A. robustus* has more venom in summer than in winter.

The greater toxicity of male spider venom, as compared with that of the female, may explain why in animals a higher mortality resulted from the bite of a male spider than from female spider bites. On the basis of one milligramme of venom per male spider, less than one-fifth of this amount of venom is required to kill a mouse when given by the subcutaneous route. In the case of female spider venom, the subcutaneous lethal dose in mice was 1.2 milligrammes. Since the average amount of venom per female spider was 1.8 milligrammes, a female spider needs to inject two-thirds of its venom. However, in order to administer this dose, the female spider has to inject six times the volume of venom which the male spider must inject in order to kill a mouse. From data presented previously it appears that about 80% of female spiders during biting are not able to inject lethal amounts of venom into mice or guinea-pigs.

No explanation can be offered for the greater toxicity of male *Atrax* venom compared with that of the female spider. This increased toxicity more than compensates for any loss of killing power the male may have otherwise experienced because of the smaller size of its venom glands.

The greater toxicity of female *Atrax* venom when injected intracerebrally and intravenously than after subcutaneous injection may be related to the site of action and rate of destruction of the venom in the body. The absence of delayed toxic effects suggests that the venom is rather rapidly inactivated in the body.

The failure of earlier investigators to observe toxic manifestations in laboratory animals after funnel-web spider bites becomes understandable if one assumes that female spiders were used for their experiments, and that only a small number of animals were tested. From our own data it appears that four mice or five guinea-pigs will each have to be bitten by a female spider before the odds are in favour of the occurrence of one or more deaths, whereas if only one mouse or guinea-pig is bitten by a male spider the odds are that death will occur in each case.

The nature of the venom of *A. robustus* remains to be identified. In addition to a neurotoxin, other pharmacologically active substances appear to be present. The effect of *Atrax* venom in guinea-pigs suggests the presence of a histamine-like substance. In view of the rapidity of effects produced after a bite, some spreading factor is probably

also present. Other fractions may be responsible for the powerful acetylcholine-like effects which followed a bite or the injection of venom, and provide a basis for the use of atropine in the treatment of funnel-web spider bites.

Summary.

1. The effects of a bite by *A. robustus* in animals have been studied. After the bite of a male spider 75% of mice and 90% of guinea-pigs died, compared with 20% of animals which died after a female spider bite.

2. Dried venom from *A. robustus* was obtained by dissecting and extracting its venom glands and by collecting venom from its fangs.

3. Toxicity studies with freeze-dried venom showed that the lethal dose in mice and guinea-pigs depended on the route of administration. The lethal doses of venom collected from the fangs of female spiders and injected intracerebrally, intravenously and subcutaneously into mice were approximately in the ratio of 1:80:260 respectively. The median lethal dose by the intracerebral route was 0.0045 milligramme.

4. Whatever the route of its administration, male spider venom was three to five times more toxic to animals than female spider venom.

5. Depending on the dose injected, *Atrax* venom produced paralysis and death of *Drosophila*.

6. The failure of earlier investigators to observe toxic effects in animals after a bite by *A. robustus* is explained on the assumption that in these experiments female spiders and only a small number of animals were used.

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SIX YEAR FOLLOW-UP MANTOUX SURVEY OF ABORIGINES IN WESTERN AUSTRALIA.

By F. G. B. EDWARDS, K. W. H. HARRIS AND S. E. SLADE,
Perth.

IN 1950 an epidemiological survey of aborigines in the Kimberley and north-west divisions of Western Australia was carried out by Mantoux testing and chest X-ray examination (King *et alii*, 1951). At that time, positive reactors were radiologically examined, and non-reactors were vaccinated with B.C.G.

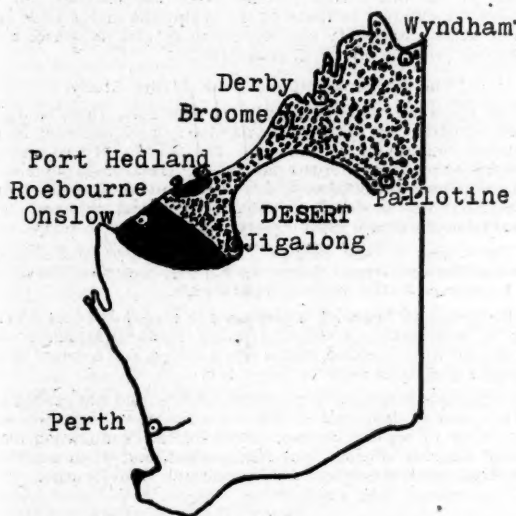


FIGURE 1.

Map showing area surveyed. Dotted area, area covered in both 1950 and 1956 surveys; solid area, additional area covered in 1956 survey.

In the winter of 1956 a further survey by Mantoux testing alone was carried out in the same divisions, with the addition of the Roebourne and Ashburton areas. Non-reactors were vaccinated with B.C.G. Aborigines were examined at nine towns, eight missions and eighteen stations, many of these being centres of operation for testing subsidiary groups from outlying places.

A total of 3542 natives was examined over a period of three months.

Methods.

Mantoux Test.

As in the 1950 survey, 0.1 millilitre of 1 in 1000 old tuberculin was given intradermally, and whenever possible the result was read at forty-eight hours, induration greater than five millimetres in diameter being considered a positive reaction.

B.C.G. Vaccination.

Whereas the wet vaccine was used in 1950, it was found more convenient in this present survey to use the dry preparation, care being exercised to protect the vaccine from direct sunlight. A specimen of dry vaccine which was carried for six weeks throughout the latter half of the survey was later examined by culture. Resulting colonies were comparable with those obtained from a freshly prepared specimen. This may be taken as evidence of maintained activity under the conditions of the survey.

TABLE I.
Overall Incidence of Natural Conversion Among Isolated Native Communities (1956).

Area.	Unvaccinated Natives.	Percentage of Reactors.
Jigalong	88	12
Pallotine	79	13
Billiluna	40	7
Total	207	15.5

Evidence of previous B.C.G. vaccination was deduced from the vaccination scar. This method, although admittedly imperfect, is more helpful than identification by name when dealing with the aboriginal population. It was found that a number (approximately 6% of those tested by us) failed to report for reading of the reaction. Watsford *et alii* (1956) had a similar experience in a recent survey of the Northern Territory.

TABLE II.
The Mantoux State in the 1956 Survey in Natives Not Previously Vaccinated.

Age Group. (Years.)	Reactors.	Non-Reactors.	Total.	Percentage of Reactors.
0 to 5	23	547	570	4
6 to 10	32	259	291	11
11 to 15	60	128	188	32
16 to 20	86	129	215	40
21 to 25	80	133	213	38
26 to 30	120	156	276	43
31 to 35	88	85	173	51
36 to 40	121	106	227	53
41 and over	388	495	883	44
Total	998	2038	3036	34.1

Results.

Fall in Conversion Rates in Unvaccinated Natives.

Systematic B.C.G. vaccination of north-west natives had not been attempted before 1950.

In 1956 a significant fall in the conversion rates was found in the nil to five years and six to ten years age groups as compared with similar rates in the 1950 survey (Tables II and III). These reductions were 7% and 10% respectively, and may be attributed to improved case finding and possibly to protection achieved by the 1950 vaccinations. However, it should be remembered that at that time the wet vaccine was employed often to the limit of its viability, and the vaccinators may not have appreciated the continuing necessity of shielding it from bright light.

Persistence of Mantoux Conversion After B.C.G. Vaccination Six Years Previously.

Of a total of 508 natives classed as previously vaccinated on the evidence of a vaccination scar, 51% were found to be positive reactors six years after their original vaccination (Table IV). In the six to ten years age group, the rate of persistence was found to be 38%. The published

evidence of persistent sensitivity following B.C.G. vaccination shows wide racial differences. Palmer (1952), testing one year after vaccination, found in Denmark a persistent sensitivity of 99%, in Egypt 50% and in Greece 87%. Briggs (1955) found persistence of sensitivity in 53% of African school children twenty months after vaccination. Enell (1952), in Stockholm, found 90% of children to be sensitive seven to eight years after the original vaccination. Wallgren (1952) states that persistence of sensitivity varies between one and ten years.

TABLE III.
Mantoux State in 1950 Survey.

Age Group. (Years.)	Reactors.	Non-Reactors.	Total.	Percentage of Reactors.
0 to 5 ..	94	256	290	11
6 to 10 ..	66	242	308	21
11 to 15 ..	101	144	245	41
16 to 20 ..	134	100	234	57
21 to 25 ..	96	106	202	47
26 to 30 ..	152	94	246	61
31 to 35 ..	79	56	135	58
36 to 40 ..	74	64	138	53
41 and over ..	455	404	859	53
Total ..	1191	1466	2657	44.8

The Effect of Contact with White Communities.

The effect of contact with white communities was demonstrated in the 1950 survey, and the same pattern was repeated in 1956. At the isolated centres of Jigalong, Pallotine and Billiluna, among those natives not previously vaccinated, 15.5% were found to have naturally acquired sensitivity, as opposed to 34% of the same group for all other centres (Tables I and II).

TABLE IV.
Mantoux State in 1956 Amongst Natives Vaccinated in 1950.

Age Group. (Years.)	Reactors.	Non-Reactors.	Total.	Percentage of Reactors.
6 to 10 ..	50	82	132	38
11 to 15 ..	49	45	94	52
16 to 20 ..	36	33	69	52
21 to 25 ..	30	18	48	62
26 to 30 ..	34	24	58	59
31 to 35 ..	15	18	33	45
36 to 40 ..	14	10	24	58
41 and over ..	30	20	50	60
Total ..	258	250	508	51

Conclusions.

1. A marked fall in the Mantoux conversion rate in the unvaccinated younger native groups (including those born since the 1950 survey) may be attributed to improved case finding amongst the white and native population in the area studied, and to the vaccination of non-reactors with B.C.G.
2. Amongst north-west natives B.C.G. vaccinated six years previously, 51% were found to be positive reactors.
3. Natural conversion rates continue to be low in the more isolated groups of natives.

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A STUDY OF 200 CASES OF DYSPEPSIA FROM THE POINT OF VIEW OF THEIR BEHAVIOUR IN RELATION TO DIAGNOSIS AND TREATMENT

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An opportunity existed under the special circumstances in the area where the present cases occurred to determine what influence normal behaviour has on the various dyspepsias. It was found that once a patient was out of hospital or the consulting room, he did not behave exactly as he was intended to. A patient's individual attitude to his symptoms and disease is a result of his personality and environment, and influences both diagnosis and the effects of treatment.

The Scope and Conditions of the Study.

The cases were studied mostly through July, 1950, to June, 1952, a period of twenty-four months; they occurred in an isolated community working on the Kiewa Hydro-Electric Project in the Southern Australian Alps. The average population for the period was 3000 men, 500 of whom had their wives and families living in ideal conditions in model villages. The remainder of the men lived under good conditions in camps.

There were a base hospital, medical centres and first-aid posts at the work sites. Anyone losing time because of illness had to be referred to the medical departments.

There was no financial impediment to diagnosis or treatment. By a contributing scheme, a man's medical attention and treatment were obtained from a single source, and a record of the amount received is used for this study.

A complete diagnostic survey was possible, and was carried out in all cases of dyspepsia in this instance where there was any possibility of organic disease. Radiological examination made use of a highly efficient spot film method, and when necessary unsolved cases were referred to consultants in Melbourne.

TABLE I.
Distribution under Diagnosis.

Diagnosis.	Number of Cases.
Peptic ulcer:	
Duodenal ulcer	45
Post-operative peptic ulcer ..	13
Ulcer-like dyspepsia with no niche ..	22
Nervous dyspepsia	62
Functional dyspepsia, non-nervous ..	23
Gall-bladder disease	13
Liver disease	3
Carcinoma	5
Diseases of the colon	5
Abnormal appendix, non-acute ..	4
Organic disease for further study ..	5
Total	200

The 200 cases studied did not include the acute dyspeptic conditions, such as acute appendicitis, acute gastro-enteritis et cetera, but covered all cases in which it was considered

necessary to carry out a complete investigation, (a) to confirm the clinical diagnosis, and (b) to institute corrective treatment. Even in the cases of nervous dyspepsia, investigations were carried out only when it was considered that some organic lesion might be present.

Five of the cases only were considered diagnostically incomplete and were listed for further study; but the patients did not return, two because of complete disappearance of the symptoms and the other three because they had left the area.

The distribution of the cases was according to Table I. The average age was thirty-seven years. There were 167 male patients and 33 female patients.

Under duodenal ulcer, only those cases are included in which a niche was demonstrable. There was one case of benign gastric ulcer, in which operation was undertaken as soon as the diagnosis was made, and this is included in the post-operative group. In the cases of nervous dyspepsia there was a neurosis or nervousness related to and aggravating the condition. "Functional dyspepsia, non-nervous" was a disorder of function without organic lesion and without an apparent nervous feature. Under this heading were two cases of diarrhoea resembling ulcerative colitis, in which the colon was found to be normal.

The Patient's Behaviour in Relation to Diagnosis.

It was thought that the "free" diagnostic service did make for ease of investigation and widened its scope.

Although there was an average delay in the diagnosis of peptic ulcer of three years eleven months, this is of no statistical significance. Some patients had been examined during that period and either an incomplete or wrong diagnosis had been made. Almost invariably, it was increased severity of symptoms which brought people along for further or initial investigation. Only two had a fear of cancer. In the post-operative group and the previously treated group, the patients had profited by their previous experience, and the recurrence of a symptom previously felt made them desire a further examination.

The cases of ulcer-like dyspepsia without niche resembled the cases of confirmed ulcer. It is believed that at some time ulcers will be or had been demonstrated in these cases, and that under the circumstances of the present study they would probably resemble a pre-ulcer or a healed ulcer condition.

The following cases illustrate delay in seeking treatment for peptic ulcer.

CASE 11.—A man, aged fifty-three years, had had symptoms of abdominal pain for fifteen years, his present attack having lasted for two weeks. He had had only self-treatment for that time, and had not consulted a doctor for six years.

CASE 164.—A man, aged sixty-five years, had had an ulcer-type dyspepsia for twenty years, with long remissions, and had carried out self-treatment during the attacks. Upon investigation he was found to have a duodenal ulcer. The investigation was carried out only because he sought attention for dysuria and was questioned further about his dyspepsia. This was the typical behaviour of the older patients.

The younger patients consisted of many with ulcer type of dyspepsia, whose severe symptoms had existed only for a few weeks before they sought investigation and treatment. The symptoms interfered with their work.

In the cases of nervous dyspepsia, the consistent finding was regular attendance with a desire for diagnosis and treatment. These people are chronic out-patients. They constitute the largest group, and do not include all the persons with nervous dyspepsia who reported for treatment during the period. They include only those whose symptoms were serious enough to warrant complete investigation to eliminate organic disease, in the belief that people with nervous dyspepsia do develop ulcers and do develop carcinomata; but in the cases studied, no organic disease was found. However, 33 of these patients (a little more than half) had some radiological sign of disorder of motility or spasm.

Many of the functional dyspepsias, non-nervous, resembled the nervous dyspepsias, but without the clearly defined clinical picture. Two were food allergies, four were secondary to cardiovascular disease.

In almost every case in these two groups, once the diagnosis of no organic disease was established, the patients were satisfied and did not ask for further investigation. None asked for reference to other consultants, though two were sent by us for confirmation. None of them that we know of were ultimately cured of their neurosis, but their symptoms were much alleviated by treatment.

There were 13 patients with gall-bladder disease—eight males, five females. Nine had cholelithiasis and four had acute cholecystitis. Seven had cholecystectomies and were cured without complications. Two had been diagnosed wrongly, one as having nervous dyspepsia and the other a peptic ulcer; both were males, and both had been given the wrong diagnosis twenty years previously. Both recovered completely and promptly once they had been investigated and treated by cholecystectomy.

Of the three patients with liver disease, one had hepatitis with hepatomegaly and recovered, one had amoebic hepatitis, and one had hepatomegaly and did not return after the initial investigation.

There were five carcinomata in the group of 200 patients. The behaviour of these five patients in relation to diagnosis is given in detail.

CASE 47.—A married woman, aged forty-one years, complained of abdominal pain and fullness and was frightened to eat because it made her feel ill. When she had initially consulted a doctor three months previously for the first time, she had expressed a fear of "tumour", because both her mother and sister had died of "tumours". She was told this was neurotic, and did not return. She had a left pleural effusion and ascites when we examined her. The ascitic fluid contained neoplastic cells, and she had a mass in the left iliac fossa. She died of carcinomatosis before the primary site had been found.

This case presented a problem in which the diagnostic error was the main factor in not bringing the patient for treatment at least three months earlier.

CASE 62.—A male patient, aged thirty years, twelve months prior to our investigation had undergone a routine X-ray examination, which had shown increased hilar markings in the chest, and he was told he had bronchitis. Six to eight weeks previously he had consulted a pharmacist, who gave him something for a dyspepsia. His abdominal pain, which was his presenting symptom, became worse, and it was the severity that brought him along for investigation. He was found to have abdominal masses and enlarged mediastinal glands, which were due to lymphosarcoma.

CASE 103.—A man, aged forty years, had had diarrhoea for eight months, but was difficult to retain for investigation because all he wanted was a placebo to stop his diarrhoea. He was convinced he had no organic disease. No abnormality was found at first; but an early carcinoma of the rectum may have been missed at an initial sigmoidoscopic examination at this time. Twelve months later, having had persistent symptoms of diarrhoea over all this period, he was again investigated, and he was found to have a certain amount of rectal obstruction and a small adenocarcinoma at the four-inch level, proved by biopsy. In spite of this, he still refused operation and saw several consultants, who advised operation; but he kept putting off any treatment. Finally, he went to England, which was his home, and after six months' further delay, apparently he suffered from an obstruction and was then operated on. He died of carcinoma six months after that.

CASE 129.—A man, aged forty-seven years, twelve months previously had lost his appetite and had had a severe attack of indigestion lasting two or three days. He was staying at a country hotel on holiday at the time, and was relieved by doses of antacid powder, which he procured from a pharmacist. When he was examined, he complained of loss of weight, abdominal pain and discomfort, much of which he thought was due to worry because his wife was dying of carcinoma. He was investigated and was found to have a carcinoma of the greater curvature of the stomach. He underwent an immediate gastrectomy; no metastases or extensions were found, but the cells were of an anaplastic type. He finally died from what was clinically a further involvement along the oesophagus. No autopsy was performed.

CASE 167.—A man, aged fifty-eight years, presented with severe constipation, which was his only complaint; it had lasted for several days. He was very timid, and his main object seemed to be to give the doctors as little trouble as possible. At laparotomy, he was found to have an inoperable carcinoma of the stomach, and he died after six weeks of inanition.

It was found that of the five patients with malignant disease involving the digestive tract, only one is still alive, with lymphosarcoma, and his ultimate prognosis is bad; the other four all died within a short time of diagnosis, and three of them shortly after operation.

In Case 167, it is unlikely that the personality and habits of the man could possibly have brought him for diagnosis earlier. In Case 129, it was thought that if the patient had been examined at the onset of the symptoms twelve months earlier he would have recovered. In Case 103, even though diagnosis was delayed for nine months, the patient's behaviour prolonged the institution of treatment to such a degree that the delay, without doubt, caused the man's death. In Case 47, the growth was probably of such a high grade of malignancy that, even if the first doctor had taken the patient seriously, she would still have been incurable.

Consequently the study, from the point of view of early diagnosis of carcinoma of the digestive tract, was very disappointing.

In the remaining cases of dyspepsia affecting the colon, as in the cases of gall-bladder disease and liver disease, it was the severity of the symptoms, which usually occurred quite early in the disease, that brought the patient along for diagnosis. Delay in instituting treatment was never very great or of importance in these cases.

The Patient's Attitude Toward Treatment.

The year 1951, being the central period, was taken to determine what treatment the patients actually took when not under strict supervision, as for example in hospital.

Of the 45 patients with duodenal ulcers, 24 were known to be attending for treatment at some time during 1951.

For peptic ulcer, the usual standard treatments—diet, antacid therapy and sedation—were used. In severe cases, or in cases in which the man lived exclusively in the camp, if his condition warranted it the initial treatment was undertaken in hospital. In most cases the response to treatment was rapid, and the patient was able to leave hospital in two or three weeks. Only one patient in the whole group did not respond rapidly to treatment, and he was in hospital for approximately eight weeks. When he left hospital he went to live on a farm with his sister. When last heard of he was still having trouble.

In the severest cases, alkaline milk drips were used to control symptoms in the initial stages, and "Banthine" was used in the treatment of patients in hospital toward the latter period.

Most patients, as soon as they had recovered from the initial acute phase, were anxious to return to work, and an ambulatory regime was advised. They were given a liberal ulcer diet, and

It is thus seen that, during the remissions, and even before the remission occurred, from the point of view of pathological recovery these patients were taking no treatment whatever, under conditions in which treatment was "free".

In the group "ulcer-like dyspepsia with no niche", it was found that as soon as the symptoms were controlled (and they were controlled more quickly than in the cases of ulcer with niche), the patients did not come for any repeats of medicine.

The following two cases illustrate how an abnormal personality affected the treatment of ulcer.

CASE 52.—A man, aged forty-one years, was admitted to hospital with the diagnosis of an acute perforation of a duodenal ulcer. He had not been examined previously, and had had dyspepsia for ten years with no consistent treatment. Two months earlier he had consulted a doctor, who had told him that he was all right after some type of radiological examination, the exact nature of which was obscure. The patient consequently took no heed of diet or medication and went back to his old habits of taking alcohol and behaving rather poorly, and consequently his ulcer perforated. The perforation was closed, and he made a good recovery. He followed treatment for only a few weeks, and then disappeared, and was known to have gone back to his old drinking habits and unsatisfactory ways.

CASE 128.—A man, aged thirty-seven years, had had abdominal pain and an ulcer-type dyspepsia for five years, which had grown worse over the last eighteen months. He had been diagnosed elsewhere as suffering from a peptic ulcer. He was found by us to have an active duodenal ulcer, and was unsatisfactory in regard to following any regime. He was an alcoholic, and used to suffer severe attacks of pain after indiscretions. During my absence on one occasion, he

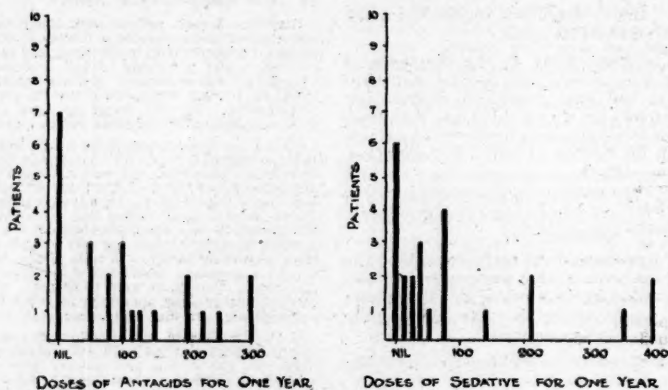


FIGURE 1.

The quantity of medicine taken by patients.

most of the men were able to obtain a diet closely resembling this in their camps. At home, difficulties in diet presented no problem whatever. In addition to diet, they were given antacids, usually of the tablet ("Gelusal") type, which they found convenient and could take while at work. Almost as a routine measure, they were given a sedative mixture in the belief that most patients liked to have a bottle of medicine. The mixture consisted of a magnesium trisilicate base, with phenobarbital (one-quarter to one-half a grain), and tincture of belladonna (seven to 15 minims) to the dose.

In each case the consequences and severity of the condition were explained to the person at the start of treatment, with insistence on his adherence to a regime. The need for him to return for repeat surveys at least at three-monthly intervals was impressed upon every patient. In spite of this, in surveying the number of doses of medicine and antacid that they actually took (*vide supra*), it was found that the maximum number of doses that a man took was an average of two doses per day for two months. With regard to the 24 patients who underwent treatment during 1951, the number of doses taken for the year are shown graphically in Figure 1. It was found that a peptic ulcer patient with nervous symptoms—and these occurred in only three of the group studied—took, in comparison, a large quantity of medicine. If these patients are eliminated, it is then found that the remaining patients took very little medicine whatever. As soon as they recovered from the symptomatic phase of their peptic ulcer, they took no medicine and no antacids, and lived on the ordinary diet of the camp or home. In many cases, when a recurrence took place they had a residue of medicine from a previous attack, untouched for several months.

was operated on for a possible perforation during one of these attacks. The ulcer was chronic, but had not perforated. He ultimately disappeared in a relatively unsatisfactory state.

These cases illustrate unsatisfactory behaviour of the patients from the point of view of treatment, because of a personality defect. They will not change their poor ways and habits to undertake any type of regime, and they repeatedly relapse.

The following are typical average cases.

CASE 75.—A man, aged forty-eight years, had had an ulcer type of dyspepsia for over five years. Approximately five years ago he underwent an investigation and was treated. He had had his present symptoms for five months, and thought he would get better. He had a duodenal ulcer, which was controlled initially by a short period of hospital treatment. He responded well and remained well. He was not seen for twelve months, during which period he took no medicine and no antacid and ate an average type of diet. After this period he had a recurrence of ulcer pain and was put on an ulcer regime again, but was observed for only three weeks and has not been seen since.

CASE 95.—A married woman, aged thirty-nine years, had had a severe attack of ulcer-type dyspepsia in the puerperium. She had had previous attacks, but was always better during pregnancy. She had a large duodenal ulcer with pseudo-diverticulum appearance. She grew rapidly better on an ulcer regime and when her adjustment to new surroundings improved; but, having recovered, she took no more medicine or antacids, and lived on ordinary food.

CASE 100.—A man, aged thirty-nine years, had had an ulcer-type dyspepsia for five years. He was examined at its onset and given symptomatic treatment, but was not investigated until he consulted us. He had a duodenal ulcer. He very quickly responded to an ulcer regime, but took medication only while his condition was bad. He was not seen again for a period of eighteen months.

CASE 114.—A man, aged twenty-seven years, had had an ulcer-type dyspepsia for three years, which became worse, and he attended for investigation. He had a duodenal ulcer, which required his admission to hospital for its control. Once his condition was under control, he took medicines for a short period, but did not return for follow-up care until much later, when he had some recurrence. On reinvestigation he still had an active ulcer.

CASE 137.—A man, aged thirty-six years, had had an ulcer-type dyspepsia for six years, and because of its severity he came for investigation. He had a duodenal ulcer, which responded to an ulcer regime, with initial treatment in hospital. He returned for small supplies of antacid and repeats of medicine only when he was having symptoms. This occurred only three times in eighteen months.

CASE 132.—A man, aged thirty-five years, had had attacks of abdominal pain which resembled an ulcer-type dyspepsia with remissions, for two years. A recent recurrence, and his impending marriage, brought him along for investigation. He was found to have an active duodenal ulcer, which healed in two to three months with an ambulatory regime. He had only a very short period of medication. He did not return for repeats, but kept to a fairly strict dietary regime. On re-examination of the patient, his ulcer was completely healed.

CASE 184.—A man, aged sixty-five years, previously referred to, had had an ulcer for at least twenty years. He took only about 20 doses of antacids, and did not return for any more.

Of the 13 patients with peptic ulcer examined after operation, eight were quite unsatisfactory. One of these (Case 46), who had undergone a gastro-jejunostomy, was having symptoms much worse than those of his original ulcer. A second (Case 58), who had previously had a perforation, was gradually developing stenosis at his pylorus. A third (Case 76), who had undergone a gastrectomy for gastric ulcer, was suffering from small stomach syndrome and was unable to gain any weight. A fourth (Case 110), who had undergone a partial gastrectomy for duodenal ulcer, had had severe attacks of abdominal pain and had a dumping syndrome. A fifth (Case 112), who had had a partial gastrectomy eight years previously, had a recurrence of his ulcer symptoms. A sixth (Case 132), who had had a partial gastrectomy, had a very severe dumping syndrome. A seventh (Case 168), who had undergone a partial gastrectomy, also had a severe dumping syndrome. An eighth (Case 134), who had had a perforation, had a recurrence of his initial dyspepsia.

Only five cases of the 13 were satisfactory. In Case 3, in which a partial gastrectomy had been performed for duodenal ulcer, the patient's condition was satisfactory, with no recurrence of symptoms. The patient in Case 71, who had had a perforation closed, had had no ulcer symptoms for three years. A duodenal ulcer patient, aged twenty-three years (Case 78), had undergone an antrooduodenectomy (Grayton Brown *et alii*, 1952) and had no recurrence, although it was only six months since operation. Another patient (Case 118) had undergone a gastro-enterostomy for duodenal ulcer twenty years previously, and his condition had been quite satisfactory, though he had advanced tuberculosis of the lungs. A further patient (Case 142) had undergone a partial gastrectomy for duodenal ulcer and stenosis, and his condition was satisfactory.

Five patients (Cases 46, 110, 112, 132 and 168) had undergone their operations in England, and their symptoms had recurred shortly after their arrival in Australia. One wonders whether the changes in environment and circumstances had anything to do with the recurrences.

In the large group of nervous dyspepsias, treatment is essentially that of the nervous state. However, in the present series it was found that as soon as the patients realized that their symptoms were of nervous origin and were not due to organic disease, and understood the origin of their symptoms and the nature of their complaint, in most cases with simple methods of therapy their symptoms were more or less under control. I agree with Alvarez (1943) that the difficulty with these patients is constitutional, and as such is quite incurable.

In the functional dyspepsias, non-nervous, the treatment was symptomatic, and the behaviour of the patients did not influence the outcome of their treatment.

In the other diseases, involving gall-bladder, liver and colon, the treatment was usually surgical, or definitely related to alleviation of symptoms by standard methods, and the behaviour of the patient towards treatment also did not influence the outcome in any way.

Comment.

In the present series of patients studied, it was found that in the peptic ulcer group diagnosis and treatment were most influenced by behaviour. It is thought that this bears some relation to the nature of peptic ulcer itself. It is also believed that a study of this type, if carried further, could throw more light on the nature of the disease.

We know that uncomplicated peptic ulcer "is a circumscribed mucosal defect which penetrates the muscularis mucosae" (Ivy *et alii*, 1950). When it becomes deeper and involves deeper structures, it usually becomes a complicated ulcer. In our cases, these complicated ulcers usually produced such definite

symptoms and signs that they required surgical treatment in the same category as the removal of gall-stones for cholelithiasis. In that respect, stenosis due to duodenal ulcer has to be removed just as definitely as gall-stones for the cure of cholelithiasis. However, in uncomplicated duodenal ulcer, when there is no involvement of deep structures, it is thought that the ulcer will heal (Ivy *et alii*, 1950), just as ulceration of the mucous membrane of the mouth or as an ulcer in the leg heals. Given favourable circumstances, it will invariably heal in a short time. In all our uncomplicated cases, the ulcers healed in a comparatively short time, and it is thought that, during the long remissions, the patient did not have active ulcer disease, and consequently had no symptoms and lived a normal life.

The consequences of taking no treatment, and of neglecting the condition, were well explained to every patient with peptic ulcer; but, having no symptoms and no effects from their complaint, once the remission had occurred they took no treatment, because they were preoccupied with many other things and were acting as normal human beings. For some reason their ulcers recurred. The reason for this recurrence, however obscure, is identical with the cause of their very first attack. The patients then came along for further investigation and further treatment. Some of them kept on returning at regular intervals in this way. Most of them tried to anticipate the recurrence and took treatment early; sometimes they prevented a recurrence, sometimes they did not succeed and required treatment in hospital. Such a case is Case 184, previously referred to; this patient, without doubt, had had an ulcer for twenty years or longer, but had learned to take his medicine when and as required. Although he had a chronic duodenal ulcer, he had developed no stenosis, had had no severe hæmorrhage, and had no complications requiring surgical treatment.

It is thought, therefore, that uncomplicated duodenal ulcer is a disease which, as Ivy indicates, can be compared with the lesser, less significant disease of mouth ulcers, which recur in the same person for some unknown reason at regular periods. In between these periods the person has a normal mouth mucosa and does not have to take any precautions about mouth hygiene. Once the disease is active again, the ulceration recurs, and the patient seeks treatment and expects the treatment to control his symptoms until his recovery.

Summary.

1. The conditions of living and the circumstances under which the study was made are given.
2. The patient's behaviour in relation to diagnosis in the various disease groups is shown.
3. His attitude towards treatment, the efficiency with which he carries it out at home or at work, and its influence on the disease process are discussed.
4. Comment is made on the relationship of the behaviour of peptic ulcer patients to the nature of their disease.

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APPENDICITIS IN PAPUA.

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ACUTE INFLAMMATION of the vermiform appendix is still one of the most frequent forms of surgical emergency to be met with in general practice among European communities. This is particularly true of the Territory of Papua and New Guinea. On the other hand, appendicitis in any form is entirely unknown among the indigenous inhabitants of the Territory of Papua and New Guinea, living in their natural environment and consuming their traditional foodstuffs; it is only when they achieve economic dependence on Europeans that inflammation of the appendix appears amongst them.

The following two series of cases occurred at Port Moresby during a period of twenty-one months from 1954 to 1956, and were all dealt with by one or both of us. Series I (Europeans) comprised 64 cases in which the appendix was involved, or which simulated acute appendicitis to a degree requiring laparotomy, or in which the differential diagnosis of appendiceal trouble appeared. Series II (natives) comprised eight cases in the same period; in only one of these was the pre-operative diagnosis of acute appendicitis in the slightest doubt.

Port Moresby, the capital town of the combined Territories of Papua and New Guinea, has a European population of approximately 4300 (1954 Census), with about another 2000 in outlying districts within emergency flying distance. Males predominate in a ratio of rather more than two to one, and the turnover in European population is relatively rapid, a fairly high proportion leaving the Territory within eighteen months.

The native population of the area immediately surrounding Port Moresby is about 10,000, of which probably less than half is permanently domiciled in the area. Again males predominate, owing to the presence of a large labour force, military and police depots, training schools and similar institutions in the immediate district.

TABLE I.
Series I (Europeans): 64 Patients.
Table Ia.

Disease Established at Operation.	Males.	Females.	Total.
Acute appendicitis	29	8	37
Relapsing appendicitis	15	1	16
Acute streptococcal peritonitis	2	—	2
Tuberculous peritonitis	—	2	2
Acute pancreatitis	2	—	2
Subphrenic abscess, secondary to appendicitis	1	—	1
Perforation of gut: amebiasis	1	—	1
Hæmorrhagic lutein cyst of ovary	—	3	3
Total	50	14	64

Table Ib.

Observation.	Males.	Females.	Total.
Appendix primarily involved	45	9	54
Other conditions	5	5	10
Deaths:			
Subphrenic abscess: appendicitis primary cause	1	—	1
Amebiasis	1	—	1
Mortality rate:			
Percentage overall for series	3.1	—	3.1
Percentage of deaths from appendiceal involvement	1.8	—	1.8

In those cases labelled "relapsing appendicitis", subacute or chronic inflammation of the organ removed at operation was recognized macroscopically by the presence of strictures and/or obvious submucosal thickening, or confirmed by histopathological examination. Two cases of appendiceal abscess were regarded as coming into the "acute" category. One patient with acute pancreatitis might have been spared laparotomy if a routine urinary diastase estimation had been carried out; but the other case, which appeared early in the series, so closely simulated a perforated duodenal ulcer that no risk could be taken. In both cases of tuberculous peritonitis the diagnosis was tentatively made before operation, but it was thought well to establish the diagnosis; in one of them, that of a female child, aged eleven years, the appendix was seen to be covered with tubercles, as was the small gut and caecum, and was removed. When sections were examined, it was found to be infiltrated with acid-fast bacilli. Both cases of acute streptococcal peritonitis were confirmed by culture of peritoneal fluid.

In Case 35, the patient, a man, aged thirty-nine years, presented himself at the out-patient department with a right posterior subphrenic abscess, which was immediately drained. He was very ill and gave a vague history which rather suggested amebiasis. His condition improved at first after drainage,

but then deteriorated, and he died eleven days later. Broad-spectrum antibiotics may have hastened his end. A small appendiceal abscess was found at autopsy.

In Case 59, the patient, a man, aged fifty-one years, with six years' residence in the Territory, mainly in the bush, had been under investigation on the medical side when he suddenly developed general peritonitis after a week in hospital. Laparotomy revealed a perforated ulcer of the anterior wall of the caecum. After suture and peritoneal drainage his condition improved a little, but the eighth day produced a burst abdomen, which was successfully repaired. In the meantime amebæ were recovered from his stools and he was given a course of emetine. However, his condition deteriorated, and he died on the fourteenth day after the original operation. At autopsy extensive amebic ulceration with multiple perforation of his small gut was found.

Of the three cases of hæmorrhagic lutein cyst of the ovary (Wilson, 1928), two closely clinically simulated acute appendicitis, while in the third instance right-sided abdominal pain brought relapsing appendicitis into the differential diagnosis.

TABLE II.
Series II (Natives): Eight Patients.

Disease Established at Operation.	Males.	Females.	Total.
Acute appendicitis	5	1	6
Appendiceal abscess	1	—	1
No macroscopic abnormality	1	—	1
Appendix primarily involved	7	1	8

Of these native cases, in six the appendicitis was of the fulminating type, the appendix being gangrenous and localized peritonitis being present except for one case. This patient, a female child, aged eleven years, had general peritonitis when first examined, with a history of symptoms of forty-eight hours' duration. The case in which no macroscopically evident abnormality was found at operation has been reported elsewhere (Wilson, 1956); this patient had a fairly clear history of previous attacks, but no symptoms or physical signs at the time of operation; the pathologist considered that a chronic inflammatory process was present in the removed appendix. This was the only native case in which a pre-operative diagnosis of acute appendicitis was in any doubt.

In our opinion considerable interest attaches to the economic status and therefore to the current dietary habits of these native patients. Two of them were police-boys, two were house-boys, one was a soldier and one was a trainee at a Government school, while the child came from a sophisticated local family. Thus none could be called "bush natives", and all had been living for some time at least on "rations"—i.e., on preserved food-stuffs of European type—tinned meat, rice, white bread, sugar and tea, with little if any fresh meat, fish or vegetables. The only exception was the man with so-called chronic appendicitis, who as a soldier was receiving a very liberal mixed diet of fresh meat, fish, fruit and vegetables. The child's diet appeared to have been mainly white bread, jam and "lolly-water", though her father was comparatively affluent.

TABLE III.
Hospital Statistics, Port Moresby, October 1, 1954, to June 30, 1956.

Hospital.	Admissions, All Conditions.	Proven Appendicitis: Number of Cases.	Percentage of Admissions.
European	2541	54	2.1
Native	5000+	8	0.1

The incidence of acute appendicitis amongst Europeans in Papua would appear to be relatively high; it occurs most frequently in males of the twenty to thirty years age group. We found that the average time of the patients' residence in the Territory of Papua in the acute cases was four months—a point of some significance, related, we suggest, to a change in dietary practice. On the other hand, the incidence of inflammation of the appendix in indigenous natives is very low and appears to be confined exclusively to those taking a diet of preserved food-stuffs.

It is suggested that dietary factors may also be concerned in the European series of cases, as it is undeniable that but little true fresh food is normally consumed by Europeans in this

Territory, at any rate in Port Moresby. This particularly applies to young males eating in messes, where frozen meat, fish and vegetables form the standard diet. The marked preponderance of males in both series is of no significance, being merely a reflexion of the current sex ratio in a shifting population.

It is regretted that no statistics are available to show the incidence of "appendicitis", acute or otherwise, in Europeans or natives in the other hospitals of the Territory during this period.

It appears to us that no conclusions with regard to the incidence or aetiology of appendicitis in Papua can be drawn from these series of cases. All it is possible to state is that the pattern of the disease, so far as we have been able to determine it with the material at our disposal, suggests that dietary factors may have some significance.

Our experience, so far as it goes, tends to confirm the generally held view that the diagnosis and treatment of acute appendicitis present no special difficulties in a tropical country (Saave, 1954), provided that reasonable surgical and anaesthetic facilities are available. In our series, in only one instance did a so-called tropical disease—*viz.*, amebiasis—occur to confuse the diagnostic picture, though in no sense to confuse the question of immediate treatment of what transpired to be a secondary condition.

Acknowledgement.

We are indebted to the Director of Public Health of the Territory of Papua and New Guinea for permission to publish this article.

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Reports of Cases.

A CASE OF SNAKE-BITE TREATED BY SPECIFIC TAIPAN ANTIVENENE.

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THE following case of snake-bite is considered worth reporting, as it appears to be the first occasion on which a specific taipan antivenene has been used. At the same time opportunity is taken to review a number of other cases of known or suspected taipan bites.

Clinical Record.

S., aged ten years, was bitten by a brown-coloured snake about 10.45 a.m. on November 30, 1955, while "trotting" in the grounds of the Freshwater State School. The bite was on the outer side of the right knee at a bony area without any underlying muscle. It was scarified fairly adequately within a few minutes by the school-master. The boy was unconscious when the school-master reached him (apparently a matter of only a couple of minutes), and he did not recover consciousness until half-way into Cairns in the ambulance (Freshwater is about seven miles away).

He was admitted to the Cairns Base Hospital at 11.15 a.m., when his condition was satisfactory. The wound was rescarified, he received 6000 units of tiger snake antivenene intravenously, and the tourniquet was released every fifteen minutes. He was pale and drowsy, but there were no central nervous system abnormalities. His condition caused no anxiety until 6 a.m. the next day, when the day sister noticed that he could open his eyes only with difficulty. He was examined by the resident medical officer at 8.45 a.m. when he had pronounced ptosis, being just able to open his eyes, and he was very drowsy. The pupils were widely dilated, both reacting slowly to light. He complained of abdominal pain and vomited about every

half hour. The bite was still oozing blood. His blood pressure was 145 millimetres of mercury, systolic, and 100 millimetres, diastolic.

At 10.30 a.m. his condition was as follows: He was very drowsy, but quite rational. His facial appearance was that of a severe myasthenic. He could only just raise his upper lids, and his eyes were slightly divergent. The left eye was completely fixed, the right showed just a flicker of lateral movement. He complained of severe diplopia. The pupils were widely dilated, the left being greater than the right, and reacted sluggishly to light. His voice was feeble and his speech was dysarthric and not easily intelligible. He had stopped vomiting at that time. There was no obvious respiratory difficulty, but he did not move well and probably had slight muscular weakness.



FIGURE I.

Approximately four and a half hours after the administration of antivenene; patient endeavouring to open his eyes.

His condition appeared to be worsening, and it was decided to regard him as suffering from taipan bite. Six thousand units of taipan antivenene were given intravenously at 10.55 a.m. and 20 units of ACTH at 11.15 a.m. He developed an allergic reaction within a few minutes, but this settled with adrenaline. At 12.30 p.m. he was given an intramuscular injection of 3000 units of taipan antivenene uneventfully.

At 1 p.m. improvement was unmistakable. This was particularly noticed in the strength of his voice, the clarity of his articulation and his general appearance. At 4.30 p.m. improvement had continued, and it seemed evident then that he would recover. Some photographs of him were taken at this stage (Figures I and II). He still had severe ptosis, but less than it had been in the morning. He had movement in both eyes, but it was not coordinated and he still had severe diplopia. Improvement continued progressively, and the next morning (December 2) at 8.45 a.m. the pupils were still dilated, but equal and reacting briskly to light. His facial expression was more human and registered emotional changes—for example, he could smile. His blood pressure was 160 millimetres of mercury, systolic, and 100 millimetres, diastolic. The wound still oozed when the bandage was removed.

On December 3 he still had ptosis, but mainly in the left eye. The eye movements were good, but he still had diplopia. His blood pressure was 165 millimetres of mercury, systolic, and 100 millimetres, diastolic.

On December 4 he still looked rather tired and shaken and had to shield one eye to prevent diplopia, but his eye movements appeared normal on clinical examination. He had no demonstrable ptosis. The wound still oozed when the bandage was removed.

On December 5 he appeared to be back to normal. The wound did not bleed, and he had no demonstrable signs and looked perfectly well.

On December 6 he was allowed up. His blood pressure was 160 millimetres of mercury, systolic, and 100 millimetres, diastolic.

On December 7 his blood pressure was 150 millimetres of mercury, systolic, and 100 millimetres, diastolic. On December 8 he was well and his blood pressure was 135 millimetres of mercury, systolic, and 70 millimetres, diastolic. On December 9 his blood pressure had fallen to 130 millimetres of mercury, systolic, and 70 millimetres, diastolic, and on December 10 his systolic blood pressure had dropped to 110 millimetres of mercury, the diastolic pressure remaining unaltered.



FIGURE II.

Approximately four and a half hours after the administration of antivenene; eyes held open, patient looking to the left.

The urine changes were interesting. On the day after his admission to hospital a "one-half" deposit of albumin was found at the ward test. The next specimen was sent to the laboratory, and examination revealed a moderate cloud of albumin and a large number of granular casts. On December 5 examination of a specimen revealed a trace of albumin and a moderate number of hyaline and granular casts. The urine was normal at the ward tests from that day. The following are the results of subsequent urine examinations: December 9, no albumin, numerous hyaline and granular casts and cellular casts; December 13, no albumin, numerous hyaline casts, occasional cellular casts, and a moderate number of leucocytes; attempted culture produced no growth; December 16, no albumin, a moderate number of hyaline and cellular casts, occasional leucocytes.

He was discharged from hospital on December 13 and has remained well since.

Discussion.

Unfortunately the snake was not captured and its identity not settled. However, the severity of the symptoms and the rapid response to the specific antivenene strongly suggest that this snake was a taipan. Dr. H. Flecker has kindly supplied the following notes:

Re identity of snake: There is no question that

- (a) Victim was actually bitten by snake which he saw.
- (b) Victim experienced local wound at site, and general symptoms characteristic of a snake bite.
- (c) Victim was running at time when leg punctured just above knee, about a foot or more from ground, so snake had head raised at time of injury.
- (d) Only seriously venomous snakes known in this region are:

1. Death adder — *Acanthopis antarctica*, which could not possibly reach to level of knee.
2. Black snake — *Pseudechis porphyriacus*, from which serious injuries are almost unknown.
3. Taipan, which could quite easily strike at this height. The Common Brown snake, *Demansia textilis*, is practically unknown in the Cairns region although quite common in almost all other Australian areas.
4. Smaller venomous snakes such as the Whip Snake (*Demansia psammophis*) could not possibly reach the height of the part struck.

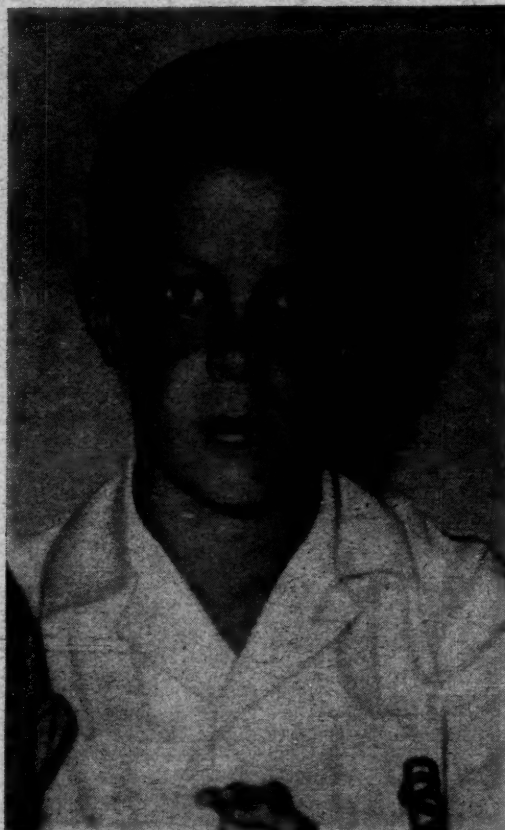


FIGURE III.

Normal appearance of patient.

A review of patients admitted to the Cairns Base Hospital since 1950 shows that there were amongst them 75 with known or suspected snake-bite. Only five of these cases, apart from the present case, call for comment, as in the rest no symptoms developed.

Those worthy of comment are as follows:

D., aged nineteen years, was bitten on December 26, 1953, at Cooktown in the early morning, and transferred to this hospital by aerial ambulance. The snake was killed and identified definitely as a taipan. At 9.30 a.m. he commenced vomiting "coffee grounds and bright blood". On his arrival at this hospital at 4 p.m. there were no central nervous system signs. By 6 p.m. he had ptosis and generalized weakness, difficulty in swallowing and speaking and a weak cough. He was placed in the iron lung and died at 1.30 a.m.

C., aged fifty-two years, was bitten by a brown-coloured snake at 7.30 p.m. on October 19, 1954. The snake "held on",

but later escaped. He was admitted to this hospital within a few minutes. He had no symptoms; his blood pressure was 150 millimetres of mercury, systolic, and 110 millimetres, diastolic. He was kept under observation and remained free of symptoms until 11.30 p.m., when he complained of difficulty in breathing, and it was noted that his voice was weak and he had bilateral ptosis. He failed to respond to the usual treatment and died the following morning at 7.35, in spite of having been placed in the iron lung in the meantime.

The next two admissions relate to the same patient. H., a professional snake catcher. On one occasion he was bitten by a broad-headed snake and on the other by a death adder, but in neither case did he develop symptoms. No doubt some immunity from previous bites and early and efficient first-aid treatment were responsible for this.

B., aged twenty years, also a professional snake catcher, was bitten by a taipan at 10.15 a.m. on July 27, 1950. By 3 p.m. he was complaining of a stiff jaw and blurred vision. By 9 a.m. the next day he had periods of dyspnoea. He was placed in the iron lung at 12.30 p.m. on July 28, but died shortly afterwards. This case has been reported by Benn (1951).

R., aged nineteen years, was bitten at Cooktown on August 17, 1949, by a snake identified as a taipan. The case has been fully reported by Flecker and Reid (1950). This is believed to be the only recovery from a taipan bite previously recorded, apart from one probable but unproved case.

The management of snake-bite causes a good deal of concern to casualty officers. In the first place it is important to take an accurate history, as in many cases it transpires that no snake was even seen and the patients' and friends' diagnoses were prompted by panic. Secondly, bites by harmless snakes should be recognized by the history and the absence of the characteristic fang marks; these patients should not be given tiger snake antivenene, which is not without unpleasant side effects and even some danger to life, and is, moreover, quite expensive. In all other cases, however, most careful observation is needed, as in some cases of snake-bite which eventually prove fatal the patients have no symptoms at all on their admission to hospital and loudly demand to be allowed to go home.

From the cases reviewed here it would appear that all victims of an attack by a possibly venomous snake should be kept under observation for at least twelve hours if mistakes are not to be made.

One point of interest is that patients bitten by a taipan appear to have had moderate hypertension.

Finally it may be said that the effect of the antivenene in this case was most encouraging.

Summary.

In the past five and a half years over 70 patients with suspected snake-bite have been admitted to the Cairns Base Hospital. Three patients have died, and these are all known or suspected to have been bitten by taipans. One other patient bitten by a death adder recovered without having developed symptoms. The remainder of the patients were probably bitten by non-venomous snakes. The details of the most recent case are reported. This boy's symptoms appeared to respond rapidly to taipan antivenene.

Acknowledgements.

I wish to thank Dr. H. Flecker for his advice in preparing this account, and the Director-General of Health and Medical Services, Queensland, for permission to publish the case.

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NEUROFIBROMA OF THE STOMACH.

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SIMPLE TUMOURS of the stomach are not common; neurofibroma is one of the less common varieties. Rogers and Adams (1956) state that of gastric tumours diagnosed on X-ray examination, 5% are benign. In a review of over 6000 cases from various authors in the United States of America and Germany, Wolf (1956) calculated that the proportion of benign to malignant tumours of the stomach was 1:50. Minnes and Geschickter (1936) estimated that almost 11% of benign gastric tumours were neurofibromata.

Clinical Record.

In September, 1955, a man, aged fifty-eight years, had a sudden onset of nausea and pain in the left side of his abdomen and the left side of his back. He vomited dark-brown material and was weak and dizzy. Subsequently he had a melaena. There had been no previous symptoms referable to the alimentary tract. During the next five weeks it was noted that the patient's weight, which was normally 195 pounds, had dropped to 170 pounds. The pain and anorexia were more or less continuous, but were not related to meals and were not affected by food or medicine.

In October (that is, four weeks after the hæmatemesis), at an X-ray examination, a tumour was demonstrated occupying much of the distal third of the stomach. An ulcer was present on the tumour. Mobility of the stomach was normal, but peristalsis did not pass through the region of the lesion.

The patient's condition gradually improved, and there was no indication of further bleeding. The hæmoglobin value had risen from 9.0 grammes per centum in September to 10.8 grammes per centum.

In November, X-ray examination was repeated, and revealed no evidence of change in the lesion. At about this time a tender lump was palpated in the left hypochondrium, but physical examination otherwise revealed no abnormality.

In December the patient was eating well, he had no anorexia, the pain had ceased and his weight had increased to 185 pounds.

In February, 1956, the lesion again appeared unchanged at X-ray examination. The patient continued in good condition. Serological tests for syphilis gave negative results.

In view of the X-ray and clinical findings, simple gastric tumour was considered to be the likely diagnosis, and in June, 1956, laparotomy was performed and a tumour was excised from the distal third of the stomach. Convalescence was uneventful.

The removed tissue was described (J. R. S. Douglas) as an ellipse of mucosa measuring 50 by 30 millimetres, containing a linear ulcer about 20 millimetres in length. Subjacent to this was a rather lobulated mass measuring 50 by 30 by 30 millimetres. On histological examination of sections, the tumour presented the structure of neurofibroma. There was some variation of nuclear size and form, suggesting the possibility of malignant transformation.

Discussion.

The clinical features of the case indicated a gastric lesion. Tumour was the likely diagnosis, in view of the loss of weight, the pain and anorexia, and the sudden onset at the age of fifty-eight years. X-ray examination revealed a gastric tumour; the likelihood that it was benign was indicated by its size, shape and mobility, and

by the presence of a superficial ulcer near the middle of the tumour. Repeated observations of the patient and repeated X-ray examinations made the diagnosis of simple tumour most likely. There are, however, no radiological features to distinguish the different types of submucosal simple tumours.

Whether benign or malignant, the tumour was shown to be slow-growing. In discussing the role of surgery, the points to be considered were: (i) the saving of life; (ii) the relief of symptoms; (iii) the prevention of complications.

If the lesion was malignant, it was considered that nothing was to be gained by urgent excision. The patient's condition was good, and he was in no distress. Excision was not likely to prolong his life or to prevent metastasis (Smyth, 1955). If the tumour was simple, the risks of not operating were: haemorrhage, chronic or acute; obstruction to the passage of gastric content through the pylorus; and malignant change in the lesion. Apart from the possibility of malignant change, the onset of complications could necessitate urgent operation to save life when the patient was older and in poor condition.

In the eight months since operation the patient has been free from symptoms. Excision has thus achieved its object of removing the source of bleeding and the risk of obstruction.

The biopsy report with regard to malignant change is equivocal. Banks (1950) states that at least 10% of neurofibromata undergo malignant change. Whether there had been malignant change in this case may never be determined, unless, of course, the patient develops metastases, in which case it will be interesting to note the failure of early removal of the primary malignant lesion to effect cure.

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NECROTIC JEJUNITIS DUE TO INFECTION BY *SALMONELLA CHOLERÆ-SUIS*.

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NECROTIC JEJUNITIS is a very rare disease. A search of the literature does not reveal any previously recorded cases in Australia; however, it is stated in an article in *The Lancet* (1949) that it is an endemic disease in northern Germany. *Salmonella cholerae-suis* var. Kuntzen-dorf is also a very rare organism in Australia.

The following report is that of a case of necrotic jejunitis caused by *S. cholerae-suis*.

Clinical Record.

The patient was a lactating female, aged twenty-two years, who had only recently immigrated from Germany, and as she spoke no English her symptoms were not easy to elicit. She was admitted to hospital from her attending local doctor on July 24, 1956, at 4.30 p.m., with a diagnosis of left basal pneumonia. Her temperature on her admission was 102.9° F. She was very restless, her abdomen being tense and distended, and she was vomiting bile-stained fluid. Physical examination of the patient on her

admission to hospital was rather difficult, as she was very uncooperative. However, her bladder was distended to just below the umbilicus. Rectal and vaginal examination revealed no abnormality. Her abdomen was distended and tense, and it was difficult to be definite about physical signs. She had no renal tenderness, and the heart and respiratory systems appeared normal. No crepitations were heard at the bases of the lungs. Her central nervous system appeared normal. An enema was given, with some return of faeces and flatus. Unfortunately a second enema could not be given, owing to the restlessness of the patient.

Her history was that eight days previously she had been treated for pleurisy by her local doctor with sulphonamide and penicillin, and she also had some lower abdominal pain; the condition settled down, but on the day prior to her admission to hospital she became delirious. This story was ascertained from relatives, also immigrants, whose English was rather vague.

A blood count on July 25 gave the following information: the haemoglobin value was 13.6 grammes per centum, the erythrocytes numbered 4,900,000 per cubic millimetre, 1% being reticulocytes, and the leucocytes numbered 14,500 per cubic millimetre, 72% being neutrophile cells, 23% small lymphocytes, 3% large lymphocytes, 1% monocytes and 1% basophile cells.

On her admission to hospital the patient was treated with "Achromycin", but her condition did not improve. On July 25 she was very vague and uncooperative. Her chest was radiologically examined, but the radiologist was not definite about any abnormal appearances. Haemorrhagic spots appeared on the abdomen, fading within twenty-four hours. Later in the afternoon she appeared more rational, although she was still vomiting. A consultant physician considered that there were râles at the bases of both lungs and that the liver was slightly enlarged. On July 26 her condition appeared slightly improved; her respirations numbered 20 per minute. Her bowels had not been opened since her admission to hospital. Her abdomen was still very distended, and she was still vomiting. She passed urine satisfactorily; the urine was normal and acid.

On July 27 her condition became much worse, the urine became scanty, and vomiting became almost continuous. Liver function tests and lumbar puncture were undertaken early in the morning and the results were as follows. The serum bilirubin content was 3.4 milligrammes per 100 millilitres, the zinc sulphate turbidity was five units, and the serum alkaline phosphatase content was 12.5 King-Armstrong units. The cerebro-spinal fluid contained two lymphocytes per high-power field; the protein content was 30 milligrammes, the chloride content 650 milligrammes and the sugar content 64 milligrammes, all per 100 millilitres. The serum electrolyte contents, in milliequivalents per litre, were as follows: sodium, 128.7; potassium, 4.4; HCO₃, 33.5. The blood urea content was 129 milligrammes per 100 millilitres.

In the afternoon the patient's condition deteriorated, and intravenous therapy was begun. She was delirious and noisy, and her abdomen was very distended. A blood culture, prepared two days previously, yielded a growth of Gram-negative bacilli. Agglutination tests were performed, and paratyphoid C organisms agglutinated with those from the patient. Intravenous therapy with chloramphenicol was instituted, but her condition rapidly deteriorated during the night, and she lapsed into a coma and died at 7.30 a.m. on July 28.

The relevant post-mortem findings were as follows. Straw-coloured fluid was found filling the abdominal cavity. There was no liver enlargement. Some fluid was present in the perinephric space of the left kidney. The intestine was distended to the second foot of the jejunum, which with the adjoining mesentery was gangrenous for a distance of approximately 12 inches.

The organism was sent to Miss Nancy Atkinson, of the University of Adelaide, who identified it as *S. cholerae-suis* var. Kuntzen-dorf, an organism particularly virulent in humans. Sensitivity tests on the organism gave the following results: it was sensitive to chloramphenicol (60

microgrammes per millilitre), to "Aureomycin" (60 microgrammes), to "Terramycin" (60 microgrammes) and to streptomycin (100 microgrammes); it was not sensitive to "Albamycin" (100 microgrammes) to penicillin (10 units per millilitre) or to polymyxin B (30 microgrammes). Histological examination of autopsy specimens gave the following results. In the liver the normal architecture was destroyed, and the picture was one of massive necrosis. There were generalized oedema of the mucosa of the affected bowel, and destruction of villi and the muscular wall, with very few leucocytes; the picture was consistent with the presence of necrosis and gangrene. Examination of the bowel where the transition occurred revealed some signs of inflammation, with leucocytes. No great abnormality was found in the spleen and lymph glands.

Discussion.

A search of the literature on jejunitis disclosed very few cases. Husebye (1952) described a case of chronic jejunitis in which a length of approximately two feet of the jejunum was swollen, stiff and oedematous; the adjoining lymph gland was infiltrated with small lymphocytes, large quantities of plasma cells and a few eosinophilic cells. The abdominal cavity was filled with ascitic fluid. The patient recovered after deep X-ray therapy.

W. L. Janus (1948) described three cases of regional jejunitis. He stated that, according to Pemberton and Brown, six out of nine patients in whom the condition was proved by operation were incapacitated or dead within two years.

In the three cases described, at laparotomy over two feet of jejunum were found to be thickened and oedematous, and mesenteric lymph nodes inflamed. However, the duration of the history varied from several months to two years. No aetiological factor was discovered in any of these cases. In these cases the condition did not go on to necrosis and gangrene of the jejunum, but appeared to present a similar picture to regional ileitis.

A case of necrotic jejunitis was described in 1949 by Fick and Wolken, of Hamburg. They referred to several cases of necrosis of the upper part of the jejunum occurring in northern Germany in 1944, and stated that it was an endemic disease there. However, the cases described were in elderly people; but the symptoms and the post-mortem findings were very similar to those in the present case. No organism was found in the bowel; however, the article of Fick and Wolken does not state whether culture of blood and gall-bladder bile was attempted.

It is conceivable that *S. cholerae-suis* was the organism responsible in the cases mentioned. This seems likely, as lethal *S. enteritidis* infection was studied in starving rats by Siegmund in 1926, and he concluded that bacteria existing inoffensively in the intestinal lumen could take on a destructive character. Nancy Atkinson (1956) states that *S. cholerae-suis* var. Kuntzendorf has highly invasive and localizing properties, producing septicaemia. Out of 2356 *Salmonellas* from human infections typed in Adelaide from 1945 to 1954, only four strains of *S. cholerae-suis* were found. When infecting humans, this organism is one of the most deadly of the *Salmonellas*. Treatment of necrotic jejunitis in Germany is by resection of the affected bowel, according to Fick and Wolken (1949). Patients in whom the condition was diagnosed before the onset of circulatory collapse have been successfully treated by bowel resection.

It is interesting to note that the patient in the present case was a German and had immigrated to this country only twelve months before her death. However, although she originally came from northern Germany, for the past ten years she had been living in southern Germany. As the organism was isolated in the gall-bladder, the patient may have been a carrier, particularly as the organism must have been present for at least a month to give an immediate positive response to agglutination tests. If so, it is possible that the attack of pneumonia prior to her illness may have lowered her resistance, to cause bacteraemia developing into terminal septicaemia.

Acknowledgements.

My thanks are due to Miss Nancy Atkinson, University of Adelaide, for identifying the organism, to Dr. G. T. Archer, of the Australian Red Cross Society, for histological examination of affected parts, and to the Pathology Department, WallSEND Hospital, for helpful assistance.

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SPONTANEOUS PERFORATION OF THE SMALL BOWEL: A DESCRIPTION OF SIX UNUSUAL CASES.

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WITH the exclusion of those cases in which spontaneous perforation occurs in distended bowel proximal to an obstructing agent, or through an actual neoplasm such as a lymphosarcoma, spontaneous perforation of the small bowel is uncommon, but may occur in the following circumstances: (i) at the seat of an anatomical abnormality such as a diverticulum; (ii) through an apparently normal area; (iii) through an area which is the seat of obvious inflammatory disease which may be (a) non-specific or (b) specific.

It is the purpose of this communication to discuss six cases of spontaneous perforation of the small bowel which were able to be classified as follows according to the above-mentioned category.

SPONTANEOUS PERFORATION IN SMALL BOWEL THE SEAT OF MULTIPLE DIVERTICULOSIS.

Case I.

This female patient was first examined at the age of seventy-nine years, when she was operated on for general peritonitis due to the perforation of a diverticulum of the upper part of the jejunum caused by a piece of wood. At the time it was noticed that the patient had multiple diverticulosis of the jejunum, but not of the ileum. The hole in the diverticulum was sutured and recovery was uneventful. (This illness was later described in THE MEDICAL JOURNAL OF AUSTRALIA—Rose, 1953, Case VII.)

The patient was then well for five years, when, at the age of eighty-four years, she began to suffer from generalized abdominal pain and vomiting. This pain became localized to the right iliac fossa at the end of three days. Examination then showed her to be a sick woman with a furred tongue, whose temperature was 100° F. There was a diffuse, tender mass in the lower right abdominal quadrant, whilst the rest of the abdomen was tender and rigid.

Operation disclosed general peritonitis due to the rupture of an abscess cavity round the terminal portion of the ileum, where one of a number of ileal diverticula had ruptured. (It is of interest to note here that the ileum was free of diverticula at the operation five years previously.) The perforation in the diverticulum was sutured and a drainage tube was inserted into the abscess cavity. Recovery was uneventful.

The patient had no further abdominal symptoms, but died nine months later from a cerebral haemorrhage. Unfortunately an autopsy was not allowed.

SPONTANEOUS PERFORATION OCCURRING IN APPARENTLY NORMAL ILEUM.

Three patients in this series belong to this section.

Case II.

This twenty-nine-year-old female patient was confined of a normal male baby, which had been conceived in one cavity of a *uterus didelphys* and delivered by the breech. During the last three months of pregnancy the patient had suffered from recurrent attacks of vague lower abdominal pain. Examination at these times revealed no cause for this pain. She was then well, having had a normal puerperium until six weeks after her confinement, when she suffered an attack of constant severe lower abdominal pain with vomiting during the six hours prior to her admission to hospital. Her bowels had been well open just prior to this attack.

Examination showed the patient to be a sick woman with a temperature of 99° F. Generalized abdominal tenderness and rigidity were present, most pronounced in the right iliac fossa.

Laparotomy revealed a ragged perforation in the otherwise apparently normal terminal portion of the ileum four inches above the ileo-caecal valve. Frank pelvic peritonitis was present, with free pus lying in the pelvis; from this *Bacterium coli* was later isolated. A double uterus was seen, and to this the terminal portion of the ileum was adherent with recent plastic adhesions. No obstruction was present in the bowel, and there was no apparent disease round the ulcer. The perforation was sutured and a tube placed into the pouch of Douglas. The patient recovered uneventfully, and has had no further similar trouble over the past four years.

Case III.

This female patient, aged seventy-seven years, had had recurrent attacks of severe generalized abdominal pain for the twelve months prior to her admission to hospital. On this day, six hours before her admission, the pain became worse and made her vomit.

Examination of the patient disclosed generalized abdominal tenderness and rigidity with distension. Operation revealed general peritonitis due to an irregular perforation in the terminal portion of the ileum two inches from the ileo-caecal valve, for which there was no obvious cause, the bowel round the perforation appearing normal. The perforation was sutured.

Recovery was uneventful until the third day, when the patient collapsed with a coronary occlusion, which was confirmed by electrocardiography. She died the following day. Unfortunately no autopsy was allowed.

Comment.

Two interesting points in Cases II and III are, first, the rather long history of recurrent abdominal pain before the actual perforation occurred, and secondly, the normal macroscopic appearance of the bowel surrounding the perforation.

Mason (1955) considers that in these cases there are no preexisting structural changes in the bowel wall. However, in view of the prior history of pain in these cases, it would appear more likely that these perforations occurred through a previously existing simple ulcer as described by Everts, Black and Dockerty (1948) under the term of primary non-specific ulcers of the small intestine, or by Wrigley (1956) as simple ulcers of the small intestine. These authors point out that these ulcers, whose aetiology is unknown, usually present themselves by their complications of perforation or, more rarely, haemorrhage and obstruction (due to fibrosis). Sixty-two per centum of these ulcers occur in the ileum, the remainder being found in the jejunum. Localized and punched out, with little or no macroscopically evident surrounding inflammatory reaction (which distinguishes them from the inflammatory state of localized non-specific jejunitis or ileitis or the more specific Crohn's disease, of which macro-

scopic inflammatory changes are a pronounced feature), these ulcers are usually single, though they may be multiple. The microscopic picture is that of a simple non-specific ulcer with little surrounding inflammation, which is non-specific and quite distinct from Crohn's disease. Unfortunately, in neither of these two cases was a biopsy specimen taken from the edge of the perforation.

Case IV.

This case was most interesting, and is placed in this section because, though the patient suffered from generalized *polyarteritis nodosa*, histological examination of the edge of the ileal perforation revealed only acute non-specific inflammatory changes.

The patient was a man, aged forty-three years, who, eleven months prior to the commencement of his final illness, suffered from a then undiagnosed illness characterized by fever, anorexia, loss of weight, colicky abdominal pain, diarrhoea and melena, and a productive cough. This illness lasted for four months, and the patient improved on symptomatic treatment.

He was then in reasonably good health for five months, when he again experienced attacks of abdominal pain and diarrhoea, with melena, nausea and anorexia accompanied by general weakness, for the ten days prior to his readmission to hospital.

When he was examined then, the patient was pale and obviously ill. Hepatomegaly, a parasternal systolic murmur and some tender subcutaneous nodules under the skin of both lower limbs were found. The haemoglobin value was 6.6 grammes per centum on his admission to hospital, and this was later raised to 11.1 grammes per centum by transfusions of packed cells. The white cells numbered 7700 per cubic millimetre, and there was a pronounced neutrophilic cell response. The erythrocyte sedimentation rate was raised. Occult blood was present in the faeces. The urine was normal, as were the blood urea level and the serum electrolyte contents. Radiographs of the long bones and the chest showed normal appearances. Biopsies of three of the subcutaneous nodules each showed *polyarteritis nodosa*.

The patient was then treated with hydrocortisone, with considerable symptomatic improvement over the next two months save for the development of indolent punched-out sloughing ulcers on both lower limbs, which resisted all approved methods of treatment. However, eleven months after the first appearance of his illness, he developed sharp, severe supraumbilical pain which radiated to both shoulder blades. This was accompanied by shock and generalized abdominal tenderness and rigidity. At laparotomy, performed shortly afterwards, the abdominal cavity was found to be full of gas and fruit salad from a perforation, ten millimetres in diameter, in the otherwise normal-looking jejunum some seven feet from the duodeno-jejunal flexure. This was the only perforation present at that time. It was closed; but the patient's post-operative condition remained one of hypotensive peripheral circulatory failure in spite of the exhibition of blood and nor-adrenaline, and he died two days later.

Autopsy revealed generalized peritonitis arising from another jejunal perforation close to the previously sutured one. The small bowel appeared otherwise normal. Microscopic examination of the bowel wall from the edges of the perforations revealed no evidence of *polyarteritis nodosa*, but only acute non-specific inflammatory changes. Histological examination of the liver and spleen confirmed the diagnosis of *polyarteritis nodosa*.

Comment.

This patient suffered from generalized *polyarteritis nodosa*, but unfortunately for the interest of the case, examination of the areas of perforated bowel showed, not *polyarteritis nodosa*, but only acute non-specific inflammatory changes. Consequently it is of interest to speculate as to what part the exhibition of hydrocortisone played in these jejunal perforations.

SPONTANEOUS PERFORATION IN AN AREA OF LOCALIZED INFLAMMATORY DISEASE.

Non-Specific Inflammatory Disease.

There were two cases in the category of non-specific inflammatory disease.

Case V.

A man, aged twenty-five years, had a thickened, red area of localized acute non-specific terminal ileitis (not Crohn's disease), in the centre of which was a ragged perforation. The illness had somewhat resembled typhoid fever, but this diagnosis was never confirmed serologically or pathologically. Treatment was by suture of the perforation, and this was followed by an uneventful convalescence. (This case has previously been fully described in this journal—Rose, 1952, Case II—so further description is not necessary here.)

Case VI.

A female patient, aged sixty years, had a history of epigastric pain radiating to the left upper abdominal quadrant for the twenty-four hours prior to her admission to hospital. In the last six hours this pain had increased in severity, and she had vomited. Examination showed her to be a sick woman with a furred tongue and a temperature of 100° F. She lay very still, and was complaining of severe, constant, generalized abdominal pain. The abdomen was tender and rigid, especially in the left hypochondrium.

At operation, she was found to have general peritonitis arising from a small ragged perforation situated in the middle of a thick, acutely inflamed segment of the upper part of the jejunum, four inches in length, and situated about six inches below the duodeno-jejunal flexure. Histological examination of the edge of the ulcer revealed acute non-specific inflammatory changes, with no evidence of Crohn's disease. The perforation was sutured and convalescence was uneventful.

A follow-up over two years disclosed no further abdominal symptoms.

Comment.

Little comment is required in these two cases, except that the aetiology of the acute non-specific ileitis or jejunitis is obscure. It is not Crohn's disease, a more specific inflammatory entity. It differs, too, from simple ulceration in being much more gross and obvious macroscopically, though microscopically the two conditions appear identical.

Specific Inflammatory Disease.

This section naturally includes perforation due to typhoid fever and tuberculosis, which were common until fairly recently, and so need not be further discussed. However, there are some types of great interest and rarity which may cause spontaneous perforation of the small bowel. Sterling (1955) describes perforation of the small bowel through an area affected by *thrombo-angitis obliterans* in a patient who also had peripheral *thrombo-angitis obliterans* of both legs. Garner, Clausgas and Hamilton (1951) described a case of acute perforation of the jejunum in an area of proven Crohn's disease. Unfortunately there were no cases in this series belonging to this section.

DISCUSSION.

The symptomatology of spontaneous small bowel perforation is more or less similar, no matter in what disease the perforation occurs—sudden abdominal pain followed by the symptoms and signs of spreading peritonitis.

In all cases the diagnosis of a perforation of a hollow viscus was made; but the exact pre-operative diagnosis was made in only two of these six cases, Cases I and V. In Case I it was known that the patient had multiple diverticulosis, and since perforation is a well-known complication of this lesion, the diagnosis was not difficult. In Case V, the patient's illness so mimicked typhoid fever

that the extra complication seemed to be a typhoid ulcer perforation. Thus the correct diagnosis of perforation was made, but the cause was not ascertained.

The treatment in all these cases was simple suture of the perforation, at times with drainage. The usual post-operative treatment for paralysed bowel, by gastric suction and intravenous fluid and electrolyte replacement, was used as a routine. In addition, penicillin and streptomycin or a broad-spectrum antibiotic such as "Terramycin" were administered intramuscularly.

Two of the six patients died—one (Case III) of a coronary occlusion three days after operation, and one (Case IV) of peritonitis from a further perforation in the terminal stages of *periarthritis nodosa*.

Acknowledgements.

We wish to thank Dr. Stuart Studdy, honorary gynaecologist and obstetrician to The Royal North Shore Hospital of Sydney, and Dr. F. H. Hales Wilson, honorary physician to the hospital, who respectively referred to us the second and fourth cases.

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Reviews.

Obstetric Practice. By H. Bruce Williams, M.B., Ch.M., F.R.A.C.S., F.R.C.O.G.; 1957. Sydney, London, Melbourne, Wellington: Angus and Robertson. 7 1/2" x 4 1/2", pp. 174, with illustrations. Price: 25s.

Those who knew and who worked with the late Bruce Williams, of Sydney, will be glad to learn that, before his death, he had set down many of his thoughts and conclusions on the philosophy and techniques of obstetric practice. His book, "Obstetric Practice", covers only 160 pages, but conveys very adequately the message that the author—even more of an individualist than most medical men—felt that he wished to pass on. It is, of course, essentially a "practical" book, dealing almost entirely with various aspects of treatment. The emphasis is on the complications of labour rather than on those of pregnancy and the puerperium.

Like most men who have acquired obstetrical wisdom by reason of many years of intensive practice in this branch of medicine, Williams continually reverts to the theme that, in the presence of obstetrical complications, there is often no single method of treatment applicable to all cases, and the obstetrician who understands how to differentiate his cases will obtain the best results. Nevertheless, he appreciates the value of dogmatism within reason, especially for the purpose of undergraduate teaching, and his opinions on most matters are clearly stated, as also are his reasons for holding such opinions.

There is a definite strain of conservatism throughout the book—surely further evidence of the author's obstetrical wisdom, for he has obviously written chiefly for the student and for the recent graduate. The more experienced obstetrician who seeks to find his own *via media* in these matters will still find much that is helpful in this little volume.

One of the best sections of the book deals with the management of malpresentations, in which respect the author's skill was legendary amongst students and house officers. As Professor F. J. Browne points out in his foreword: "The author does not pretend to have written a text

book of obstetrics; he is concerned with the problem of procuring a live infant." The concept of obstetrics as an art as well as a science is well to the fore, and in various homely touches the author reminds his readers of the sensibilities and the anxieties of the parturient woman. ("I hate the term labour ward—delivery room is a better term.")

It may be that, in due course, Dr. Williams's protégés will bring out a second edition of this book. In the meantime it stands as a useful personal record of the obstetrical beliefs of this well-known Sydney obstetrician.

Dextran: And Its Use in Colloidal Infusion Solutions. By Anders Grönwall, M.D.; 1957. Stockholm: Almqvist and Wiksell. New York: Academic Press, Incorporated. Oxford: Blackwell Scientific Publications. 8½" x 5½", pp. 166, with 28 illustrations. Price: 20s.

This is a comprehensive survey of the literature covering all aspects of research on dextran. Preliminary investigations into the use of dextran as a plasma volume expander were commenced by Grönwall (the author) and Ingelman in 1942, and resulted in its introduction by them into clinical medicine ten years ago. Grönwall now discusses impartially the place of synthetic plasma volume expanders in general and of dextran in particular in the treatment of shock and burns. He does not expect that dextran will replace albumin or plasma, but believes that it is a useful substitute when neither albumin nor plasma is available. Dextran is shown to fulfil more closely the requirements of an ideal colloidal infusion solution than any other synthetic solution at present available. It is relatively cheap to produce and can be manufactured in large quantities.

Dextran is produced by the action of specific bacteria on sucrose. The variability of different commercial preparations is shown to be due to such factors as the bacterial strain used, the pH and type of the culture medium and the time of incubation. The size of the molecule is important and is fully discussed by Grönwall.

Dextran is weakly antigenic in some humans, but the author holds that antigenicity decreases with diminishing molecular size. Antibodies which react with dextran are found in normal persons, probably as a result of a common hapten in the dextran molecule and on the surface of certain strains of pneumococci or salmonellae. It is stated that clinical reactions to dextran do not occur more frequently in such patients than in patients without antibodies. Pyrexial and urticarial reactions have been reported. Pseudo-agglutination of red cells and an increase of the erythrocyte sedimentation rate due to rouleaux formation may occur temporarily. The fate of injected dextran is discussed, and evidence is presented that dextran is broken down in the body.

A large section is devoted to the results of clinical investigation with dextran solutions. The author considers that dextran is at least as effective as plasma or albumin in the treatment of hypovolemia. However, there seems to be little likelihood that dextran will replace blood or blood products in the treatment of hypovolemia in civil life. For this reason the book will be of most interest to the specialist in the field of parenteral therapy.

General Urology. By Donald R. Smith, M.D., illustrated by Ralph Sweet; 1957. Los Altos: California: Lange Medical Publications. 10" x 6½", pp. 336, with illustrations. Price: \$4.50.

This is a new type of publication for students and practitioners. Lithographed in the United States of America by the Lange Medical Publications as one of its concise handbooks, the book reads as a students' summary with many clear headings and concise phrases.

The chapter arrangement is conventional; the book begins with the anatomy of the urinary tracts, and this is followed by a consideration and explanation of symptoms. The various distributions and types of pain are clearly detailed, and it is pleasing to see sections devoted to gastro-intestinal symptoms of urological diseases, and the differentiation between renal and radicular pain. There is a good chapter on instrumentation, and a most useful one on urinary obstruction and stasis.

More trust is placed in the urethral catheter in the treatment of urethral injuries than is usual in this country, and cystostomy is reserved for only the more severe states. This, however, is a good chapter. The author points out that perineal haematoma, in this era of antibiotics, require incising only when they have become infected or when urinary extravasation is present.

The chapter on tumours is valuable, if only because of two full-page drawings depicting the sites and routes of metastases in both male and female. It is emphasized that prostatic enlargement is not an "hypertrophy", but a true hyperplasia or new growth of the periurethral glands. The pathogenesis, pathology and clinical findings are clearly portrayed and explained, but, as throughout the book, operative treatment is only outlined.

Ureteral stricture is recognized, but mainly that of congenital origin. The importance of the excretion urogram is emphasized, but no mention is made of the compression bandage, which most radiologists use today, and which will usually obscure this diagnosis.

The importance of triple micturition in the treatment of megalo-ureter is not mentioned; but the last chapter, on psychosomatic urological syndromes, is excellent, and fills a common want.

This book should prove most valuable for students and also for general practitioners as a ready reference. It is up to date and contains numerous informative drawings, and its notebook style makes it attractive to the busy reader. Also, it is relatively cheap.

Books Received.

[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]

"Foot Troubles", by T. T. Stamm, F.R.C.S.; 1957. Modern Health Series. London: Gerald Duckworth and Company, Limited. 7½" x 5", pp. 126, with eight plates and nine illustrations. Price: 8s. 6d.

An account of the human foot and its troubles written for the non-medical reader.

"Consideration about Cessalpius' and Harvey's Works on the Blood Circulation Discovery"; 1957. New York: Alcaeon Publications. 10½" x 8", pp. 27. No price stated.

A point of view on the controversy about priority in the discovery of the circulation of the blood.

"Fluid Balance in Surgical Practice", by L. P. Le Quesne, D.M. (Oxon.), F.R.C.S. (Eng.); Second Edition; 1957. London: Lloyd-Luke (Medical Books), Limited. 8½" x 5½", pp. 148, with 42 illustrations. Price: 20s. (English).

The entire text has been revised since the publication of the first edition, and a new section has been included on the problems of fluid balance in infants and children undergoing surgery.

"Medical Ethics: A Guide to Students and Practitioners", edited by Maurice Davidson, M.A., D.M., B.Ch. (Oxon.), F.R.C.P. (Lond.); 1957. London: Lloyd-Luke (Medical Books), Limited. 8½" x 5½", pp. 176. Price: 20s. (English).

Contains 14 individual contributions by leading members of the medical profession and others in the United Kingdom.

"Science News: 44", edited by Archie and Nan Clow; 1957. Mitcham, Victoria: Penguin Books Proprietary, Limited. 7½" x 4½", pp. 128, with four illustrations. Price: 4s.

Contains eight articles including one on the blood and one on the differentiation of the sexes.

"Structural Psychology: De Humani Mentis Fabrica", by D. and K. Stanley-Jones; 1957. Bristol: John Wright and Sons, Limited. 8½" x 5½", pp. 188. Price: 21s. (English).

"The primary theme of the book is the unity of Mind and Brain. This has been explored first from the side of neurology and neuro-physiology, and related point by point to the speculations of psychology."

"Movement of the Heart and Blood in Animals: An Anatomical Essay", by William Harvey, translated from the original Latin by Kenneth J. Franklin and now published for the Royal College of Physicians of London; 1957. Oxford: Blackwell Scientific Publications. 8½" x 5½", pp. 222, with one illustration. Price: 17s. 6d. (English).

A completely new English translation of *De Motu Cordis*.

The Medical Journal of Australia

SATURDAY, SEPTEMBER 14, 1957.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given: surname of author, initials of author, year, full title of article, name of journal, volume, number of first page of the article. The abbreviations used for the titles of journals are those adopted by the Quarterly Cumulative Index Medicus. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

THE PROCESS OF AGING.

THE CIBA FOUNDATION has been holding a series of colloquia on aging, and three volumes have now been published giving the papers by noted workers in the field of gerontology with the discussions on these papers. It is of interest to turn to the third of these volumes, which deals with the methodology of the study of aging.¹ The subject has been treated very widely, and it is apparent that the questions involved demand more thought than they sometimes get. R. E. Tunbridge puts the position clearly: "Clinicians, with the possible exception of the paediatricians and the obstetricians, are inevitably concerned with disorders of the aged. Often they are so near in age to their patients that they are unable to make an objective assessment of the changes which might be associated with increasing longevity. The approach of a clinician is essentially individualistic both from his own and the patient's viewpoint and has all the bias of such an approach . . . Certain pathological changes, e.g., atheroma, arteriosclerosis and cancer, which are more prevalent during the second half of life, are often referred to as disorders of old age, yet there is little to justify the vast literature that purports no more than this."

A variety of approaches to the subject may be made. That adopted by F. Veszar is interesting. It is the study of changes in adaptation which occur with increasing age. Adaptation is defined by Veszar as "the general capacity of living organisms to live under continuously

changing conditions". He points out that the greatest adaptation process occurs in the few hours or minutes after birth, when the fetal respiration, circulation and nutrition have suddenly to be transformed to meet entirely new conditions. Over the years of childhood adaptation increases, so that remarkably varied conditions can be met successfully. In the young animal adaptability increases beyond normal requirements to the point where large reserves of adaptation are accumulated. From a certain age adaptation as a whole becomes less complete, and it continues to become less with increasing age. At 15 years of age a boy shows a decreased accommodation capacity of his eyes, his hearing is becoming less extensive, and later his athletic powers decrease. A 25-year-old athlete is not able to do what he could do at the age of 22. Mental and psychical capabilities are more difficult to assess; but with increasing age learning becomes more difficult, even though the factor of experience introduces difficulties in interpretation.

When the capacity to accommodate visually has reached its limit, man has reached his fiftieth year. In primitive life he can see well enough in his cave, but he cannot quickly enough notice his enemies in the jungle. At about the same time ovulation has ceased in his female partner; so that from the point of view of the race they have become superfluous—that is to say, from a physical point of view. In the human race this idea is complicated by the fact that the mental processes may go on for many more years without much deterioration. Veszar regards a decrease in the capacity for adaptation as the main characteristic of aging. At the same time we cannot look to apparent morphological changes to account for the whole of the loss of adaptation. Adaptation is a dynamic process. The capacities to integrate complex functions diminish in failing adaptation. Some of these persist much longer than others.

Changes in the tissues may not be obvious in older people at a macroscopic or even a microscopic level, and there are clear indications that many of the changes are at the molecular level. Connective tissue plays a very large part in many tissue activities; and while obvious changes in some tissues can be seen in aging, e.g., in the skin, most of the changes are molecular. Veszar notes with approval the work done by R. E. Tunbridge and his co-workers on the changes associated with aging of collagen to an elastin-like substance; at the same time there is a lessening of the amount of true elastic tissue. Veszar has shown that if a collagen tendon fibre is exposed to heat, the older the animal the larger the loads necessary to inhibit the thermal contraction of the fibre. Similar phenomena can be seen in the whole skin and nerve. He explains this as an increase in "cross-linkages", perhaps of H bonds between the collagen molecules in the aged. This explanation for the changes is also given by other investigators. J. Baló has found that after contraction of the collagen fibre relaxation occurs. At the time of contraction mucopolysaccharides are dissolved from the fibre, and at the time of relaxation procollagen is dissolved. In the aged fibre the procollagen cannot be dissolved.

The marked degenerative changes, apart from atherosclerosis and arteriosclerosis, that occur in the aorta and

¹ "Ciba Foundation Colloquia on Ageing: Volume 3: Methodology of the Study of Ageing", edited by G. E. W. Wolstenholme, O.B.E., M.A., M.B., B.Ch., and Cecilia M. O'Connor, B.Sc.; 1957, London: J. and A. Churchill, Limited. 8" x 5½", pp. 214, with 47 illustrations. Price: 32s. 6d.

major arteries in the elderly have long been noted. The loss of elasticity is all too apparent. A striking increase in the calcium content of aorta and pulmonary artery with increasing age has been studied by several workers. Amino acid analyses reveal differences in the composition of the aorta at different age levels, the amounts of aspartic and glutamic acids increasing with age.

J. Baló discusses the finding of elastase in pancreatic tissue. He states that in suitable conditions this enzyme dissolves elastin. The elastic tissue in the arteries of new-born children is not dissolved by elastase over a period of three days, while in an old individual it is quickly dissolved; this indicates a difference in the chemical composition of elastin at different ages. It is found further that the amount of elastase in the pancreas, abundant in childhood, falls to almost nothing at 60 years of age. Baló considers that elastase is of decisive significance, not only in the decomposition of elastic fibres, but also in their synthesis. Changes in the skin with increasing age are obvious to all, and there is no convincing evidence that many of these are brought about by exposure. After the age of 60 years, no matter what the previous occupation or mode of life of the individual, these changes become obvious. Histological examination shows an increase in elastin-like material with a concomitant decrease in the elasticity of the skin. Tunbridge and his co-workers have shown that most of this apparent elastin is really altered collagen, and that the amount of true elastin is diminished. It is, at present, impossible to know how far the changes are the result of disease processes and how far they can be taken as evidence of a biological process of aging. The balance of evidence is distinctly in favour of the second alternative.

In the Ciba report there are a number of other approaches to the study of the aging process, but the one summarised here seems to offer opportunities for detailed studies of at least some aspects of the process. One of the difficulties in all researches in gerontology is in deciding what is normal, in the sense of "without abnormality" or "free of pathological change". The majority of clinical surveys of aging populations are open to criticism because of this fact. Still, some useful surveys are being carried out in different places. The largest is being undertaken in Holland, where a comprehensive survey is being made of the whole country; this includes, besides a full medical and social history, a complete physical examination and an assessment of mental function.

Not all observers will agree that there is an aging process not associated with disease. For example, G. R. Cameron, in Volume I of the Ciba Foundation Colloquia on the subject, states: "I doubt very much whether there are specific structural changes due to old age and that alone. I hold the view that ageing is merely the vector sum of a number of morbid processes, most of which take time to develop, and often a long time to reach a serious climax." This seems a rather pessimistic point of view, and no doubt tissue changes will continue to be looked for which are not due to morbid changes. No doubt too most of us will show morbid changes when we die, although it is often impossible to say which morbid process has killed us.

AN HONOUR FOR DR. MERVYN ARCHDALL.

THE Federal Council of the British Medical Association in Australia, meeting in Adelaide on September 1, 1957, resolved by unanimous vote to award the Gold Medal of the Association in Australia to Dr. Mervyn Archdall. Coming at the time of Dr. Archdall's retirement from the Editorial Chair of THE MEDICAL JOURNAL OF AUSTRALIA, this award provides a worthy climax to a career of unstinted service to the medical profession in Australia. The Gold Medal has been awarded on very few occasions and a high standard is set for it, but its award has never been more justified than in the present instance. Dr. Archdall's many friends, both within and without the medical profession, will join us in offering congratulations to him and in expressing real pleasure at the recognition of his service to medicine in Australia.

EDITORIAL CHANGES.

At the meeting of the Board of Directors of the Australasian Medical Publishing Company Limited, held in Adelaide on August 29, 1957, the Directors appointed Dr. Ronald Winton to succeed Dr. Mervyn Archdall as Editor of THE MEDICAL JOURNAL OF AUSTRALIA on Dr. Archdall's retirement on August 31, 1957. Dr. Archdall was appointed Consultant Editor. Dr. Arthur Gwynn was appointed Assistant Editor. Miss Dorothy Tremlett, who has been Lay Sub-Editor of the Journal since November, 1946, was appointed Lay Assistant Editor.

Current Comment.

RECENT OUTBREAKS OF INFECTIOUS DISEASES IN BRITAIN.

INFECTIOUS DISEASE has been curtailed but not conquered. Despite remarkable progress in routine prevention, outbreaks continue. Most of these illustrate old principles, but some suggest new ones. All warrant study if our knowledge of epidemiology is to be enriched and the quality of prevention improved. For these reasons alone S. Leff's unusual book, "Recent Outbreaks of Infectious Disease", is worth reading.

Leff has done a special service to health officers and doctors interested in infectious disease by assembling, in convenient form, data from many British outbreaks. His book comprises sections on smallpox, poliomyelitis, "Q" fever, psittacosis, Bornholm disease, enteric fever, food poisoning and diphtheria, and includes a description of an outbreak of lead-poisoning and a discussion of the London fog in 1952. The smallpox outbreaks indicate what might happen here if the quarantine barrier were penetrated. Poliomyelitis is only too well known in this country, and Australian workers will find little that is new on that subject in this book. The sections on "Q" fever, psittacosis and Bornholm disease are useful, and emphasize important epidemiological features which are perhaps not widely appreciated. Typhoid is now mainly sporadic in Australia, but the 1953 "coconut episode" highlighted its constant epidemic hazard; the British outbreaks attributed to milk, water and ice cream are significant, and the use

"Recent Outbreaks of Infectious Diseases", by S. Leff, M.D., D.P.H.; 1957. London: H. K. Lewis and Company, Limited. 5½" x 5½", pp. 420. Price: £1 15s.

of phage-typing in their investigations is instructive. Food poisoning is a neglected study in most States, and the British experiences will stimulate the interest of all concerned with food safety and will aid future investigation. Britain has a magnificent record in diphtheria control, so much so that "measures adopted for its control now approximate to those taken in an epidemic of smallpox"; the descriptions of action taken in several limited outbreaks are therefore of particular interest. The outbreak of lead-poisoning ascribed to the burning of waste battery casings must be unique. The book concludes with a brief account of "smog", with special reference to the 1952 and lesser disasters.

The historical introduction to each of the epidemic diseases dealt with is of some interest, but, like the clinical descriptions, might well have been omitted from a book of this nature. Several of the tables lack titles and explanatory notes. The bibliography is excellent. The paper, printing and binding are good, and this book should find a place in every medical library.

A DOCTOR AND HIS LIFE.

INTERESTING aspects of how a doctor may think about himself and his work are brought out in "Being Lived by My Life", which is the caption for "a sort of autobiography" by psychoanalyst Charles Berg.¹ Woven into the intimate details of his personal life are case histories and views on the origins of human behaviour. He certainly had a chequered career. Born in India, travelling about the world backwards and forwards from Asia to Europe, he commenced his university life at St. Thomas's Hospital, London, prior to World War I. After qualifying he entered the Indian Medical Service. On returning to England, he decided to go into general practice, and as a "refresher" took a post in a maternity hospital. Whilst he did not develop "the God complex", he became extremely sympathetic to his patients. He felt it more satisfying for him to attend to them than to do anything else whatever, and the learning of such an emotional attitude was invaluable for a doctor. "One must be sunk in the thing", like Newton in his mathematics and Darwin in his biology.

As a general practitioner Dr. Berg was a success. His patients multiplied. He spent much time in "head to toe" examinations and estimating colour indices. Emphasis was laid on the organic factor. Slowly, however, the psychogenesis of symptoms became increasingly obvious. Diseases and accidents tended to occur in certain types of individuals. The emotional conditions in infancy were important, as were also current emotional precipitating factors. There were, *inter alia*, the revealing case of a young woman who wanted an appendicectomy (an operation to satisfy an erotic urge) and other cases of a similar nature, in which post-operative improvement was short-lived. Such surgery seemed useless. It obviously was not reaching the cause of the disorder. Finally, attitudes concerning the importance of the psychogenic factor in human disease compelled the author to attend classes in psychology, to take a diploma in psychological medicine and a doctorate in medicine, to undergo a personal psycho-analysis, to spend a fourteen-year term on the staff of the Tavistock Clinic, and finally to carry on a busy psychoanalytical practice in Harley Street.

Whilst Berg obviously enjoys his therapeutic and medical triumphs, he is refreshingly frank about his conflicts and complexes. There is much concerning his mother-father relationships, sex traumata and personal inadequacies. The way was not always easy. A recital of his difficulties is helpful.

Running as a theme throughout the book is an insistence on the importance of the unconscious, whose roots are

laid in the urges of infancy and childhood. We relive time and time again the unrecollected episodes of early days.

Analysis shows that what we are doing is compulsively repeating the emotional patterns of our past, dating right back to infancy and earlier, and merely manipulating the things and persons around us in order to facilitate our acting out of the tensions belonging to these unconscious repressed patterns and complexes of ours.

Often the presenting symptoms, our aches and pains, are but the props in a tension-relieving psychodrama. The remedy is an adjustment in our way of living and in our understanding of ourselves.

The book has the merit of being clearly written and containing a minimum of technical terms; it is within the grasp of the average reader. Its expressed intention was to intrigue and interest; this aim has been achieved. It is well worth a place on the shelves of those who have patients or personal problems.

URETERAL REGENERATION.

VARIOUS questions of interest and importance are raised by R. G. Weaver's experimental and clinical study of the possibilities of regeneration of the various coats of the ureteric wall after injury (accidental or surgical), the second part of which he has now published.² Rapid strides are being made in our knowledge of the behaviour of the ureter after extensive injury; but we have yet to learn the effect of ureteric regeneration upon the kidney. This organ is dependent on good ureteric function for its efficient emptying. Animal experiments and clinical observations show that, after the repair of large ureteric defects, the kidney functions well, but has a reduced ability to empty itself, and moderate dilatation of the pelvis and calyces develops. Larger splints at the plastic or repair operation produce marked fibrosis and severe stricture formation, whereas smaller splints give an adequate lumen in the final result. This point is the chief thing to be learnt about the operative technique. Experimentally, the regenerated segment shows moderate variations from the normal—namely, thinner muscular and mucosal layers, slower and less intense peristaltic waves and decreased density of the nerve pattern. It appears that the important principles of the technique of surgical repair of long strictures of the upper part of the ureter are intubation with a small calibre splint, efficient nephrostomy deviation to prevent urine leakage in the site of the ureterotomy (the ureteropelvic junction to be in a dependent position), and removal of a good part of the dilated pelvis.

SUFFOCATIVE GOITRE IN THE NEWBORN.

SUFFOCATIVE GOITRE in the newborn is fortunately rare. However, according to J. Handelsman and H. Sussman,³ cases of goitre in the newborn are being reported in increasing numbers; apart from sporadic cases of congenital goitre, it is suggested that the principal cause for the increased incidence is the administration of thiourea derivatives to thyrotoxic women during pregnancy. Handelsman and Sussman report a successful thyroidectomy carried out to relieve respiratory obstruction in an infant aged six days with suffocative goitre. They have found only six other similar cases in the American literature, which they discuss. The children affected ranged in age from fifteen hours to thirteen months. The conclusion of Handelsman and Sussman is that prompt surgical intervention may be life-saving in a child so affected.

¹ "Being Lived by My Life: A Sort of Autobiography", by Charles Berg; 1957. London: George Allen and Unwin, Limited. 8½" x 5½", pp. 256. Price 21s.

² J. Urol., 1957, 77:164 (February).

³ Ann. Surg., 1957, 145:108 (January).

Abstracts from Medical Literature.

DERMATOLOGY.

Lymphocytic Infiltration of the Skin (Jessner).

C. D. CALMAN (*Brit. J. Dermat.*, May, 1957) describes in detail eight cases of lymphocytic infiltration of the skin (Jessner). There is a heavy preponderance of males. The usual sites are the malar region and the back of the chest; but the forehead, neck, mastoid region, arms, legs, chest or abdomen may be affected. The lesions are aggregated erythematous papules varying in diameter from two millimetres to two centimetres, and may be arranged in crescents or rings. Their colour is a uniform rose-pink, and there is no scaling or other change. The prognosis and course of the condition are variable. The patients give a history varying from some months up to about ten years. Most patients have periods of freedom for a few weeks or months, but none has recovered permanently or for any considerable time. Histologically the epidermis is always normal. The entire network of vessels is enveloped in a dense mantle of lymphocytes; this process may extend down to the fat, and the tissue spaces of the dermis may be permeated with lymphocytes. In a differential diagnosis the following may have to be considered: *lupus erythematosus*, a reticulosis, chronic annular erythematosa, polymorphic light eruption, sarcoid and syphilis. The same appearance may be seen in insect-bite reactions. Mepacrine and chloroquine sometimes clear the eruption dramatically, but do not consistently do so. In no case has the condition been reported to progress to lymphoblastoma or leukaemia.

Use of a Pumice Stone in Psoriasis.

C. S. WRIGHT AND D. N. TGHAR (*Arch. Dermat.*, May, 1957) advise patients to employ a pumice stone to massage in the prescribed application in all psoriatic areas except the scalp and face. This procedure increases the amount of oil or ointment that can be rubbed in, and also removes loose scales and does not irritate the fungus. The desire to scratch is lessened. The method is demonstrated to patients, care being taken to emphasize that too much force must not be used, as it may result in pin-point hemorrhages. They are further instructed to wipe off any oil or ointment not absorbed, thus lessening the damage to clothing and bed linen.

Discolored Lupus Erythematosus following Trauma.

A. B. KERN AND B. L. SCHIFF (*Arch. Dermat.*, May, 1957) give the histories of five cases in which *lupus erythematosus* arose in sites of trauma. On the basis of the reports in the literature, their own five cases and the results of a questionnaire, there appears to be no question but that trauma, in at least some cases, may be an important factor in the pathogenesis of *lupus erythematosus*. It appears not unreasonable to assume, therefore, that in an individual with a predisposition

to *lupus erythematosus* by virtue of a focus of infection, tissue sensitization due to earlier infections or some other obscure cause, trauma may, by lowering the tissue resistance, make the site of injury more susceptible to the development of a lesion.

Treatment of Moniliasis with "Nystatin".

E. T. WRIGHT AND T. H. STERNBERG (*J.A.M.A.*, January 12, 1957) state that "Nystatin" has been used topically and systemically in man for the treatment of moniliasis. It is effective in controlling infections due to *Candida albicans*, and side reactions have been minimal with the doses used. The capsules and tablets were used as troches and suppositories containing 125,000 to 500,000 units of "Nystatin"; in addition, some contained 2.5 milligrammes of neomycin sulphate and 0.25 milligramme of gramicidin. The cutaneous infections were treated with applications of ointment and solutions four times daily. Oral infections were treated with solutions, troches and capsules, and with tablets used as troches four times a day. In addition, the powder was used orally four times a day; one teaspoon of it was mixed in a glass of milk or water and used as a mouth wash. Vaginal infections were treated once daily with the use of disposable applicators, suppositories and tablets and capsules used as suppositories. Ordinarily treatment periods varied from three days to one month. The type of vehicle in which the "Nystatin" was placed influenced the clinical effectiveness. Solutions were more effective in intertriginous areas. The addition of hydrocortisone to the therapeutic solution shortened the course of therapy. There were no instances of allergic contact dermatitis or of primary irritation following treatment.

Chloracne in the Manufacture of DDT.

S. S. BOWEN AND M. P. MOURSUND (*Arch. Dermat.*, May, 1957) report a case of chloracne in a person working in the manufacture of DDT. DDT may be manufactured from chloral or chloral hydrate by condensation with chlorobenzene in the presence of sulphuric acid. The primary ingredients, as well as the final product DDT, are chlorinated hydrocarbons.

Superficial Mycotic Infections of the Skin.

J. L. CALLAWAY AND S. OLANSKY (*J. Chronic Dis.*, May, 1957) state that *tinea pedis* is the most common form of superficial fungous infection. The common organisms found are *Epidermophyton floccosum*, various species of *Trichophyton* and rarely species of *Microsporum* and *Candida albicans*. The authors describe four clinical forms: (i) chronic hyperkeratotic, (ii) chronic intertriginous, (iii) subacute, (iv) acute. The epidemiology of *tinea pedis* is not clear. Vascular disease of the extremities and hyperhidrosis seem to be important determinants in the susceptibility of people to fungous infection of the feet. Diagnosis can be made only by demonstrating pathogenic fungi in the lesions. In discussing treat-

ment, the authors advise "soaks" of potassium permanganate solution (one in 4000 or one in 8000) followed by the application of Castellani's paint, half-strength Whitfield's ointment, "Pragmatar" ointment or "Asterol" ointment, etc. Patients with acute and infected lesions should be treated with rest in bed and the continued application of wet compresses of potassium permanganate solution, Burrow's solution (one in 40) or silver nitrate solution (0.25%) is very effective. Vesicles and pustules should be clipped. When the acute stage subsides, management is similar to that described for the chronic forms. Dermatophidids ("ids") are discussed. They are secondary eruptions occurring in specifically sensitized individuals by hematogenous spread of fungi or their products from a primary focus. For *tinea cruris* the authors advise potassium permanganate "soaks" followed by the application of Castellani's paint. In *tinea corporis*, treatment is with "Pragmatar" ointment, half-strength Whitfield's ointment, 3% precipitated sulphur, and 3% salicylic acid ointment or Castellani's paint. Erythrasma is a superficial infection caused by *Nocardia minutissima*. *Tinea versicolor* is an infection caused by *Malassezia furfur*; its lesions are irregular, fawn-coloured, scaly patches resembling erythrasma, but lighter in colour. In summer the uninvolved skin becomes dark and the involved areas remain light (pseudochromia). For treatment, the authors advise scrubbing with soap and water twice daily, followed by the application of sodium hyposulphate solution (20%) or Castellani's paint. *Trichomycosis axillaris* is an infection of the axillary or pubic hair by *Corynebacterium tenuis* or *N. tenuis*. Concretions, black, yellow or red, form on the hair in bead-like nodules or as a continuous sheath. Diagnosis is made by examining hairs on a slide with a 10% solution of potassium hydroxide. The axillary or pubic hair should be shaved, and this should be followed by daily application of formalin (2%) or bichloride of mercury (1%) in alcohol (90%) or sulphur ointment (3%).

Boric Acid Poisoning.

J. W. JORDAN AND J. T. CRINEY (*Arch. Dermat.*, May, 1957) report a fatal case of boric acid poisoning from cutaneous use in an adult. A study of 22 patients with various skin conditions treated with boric acid preparations failed to show a significant rise in blood boric acid levels. The authors state that boric acid may be used in treating skin conditions, but should not be employed over large body surfaces, and treatment with the drug should not be prolonged.

Chronic Leg Ulcers.

S. T. ANNING (*Postgrad. M. J.*, January, 1957) states that there are many varieties of leg ulcer, and even in the common venous ulcers multiple factors play a part in the aetiology. Every patient must be assessed individually. Preventive treatment is discussed. Saphenous ligation may be useful, but should not be carried out lightly if there is the possibility of a previous deep thrombosis. In the treat-

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ment of venous ulcers, the importance of eliminating oedema is stressed, and various methods of doing so are mentioned, especially that of compression. Local treatment of the ulcer is of secondary importance. Surgical treatment is briefly discussed. Patients with ulcers caused by arterial disease need warmth and rest in bed, and this treatment should be given a trial. The limb is bandaged loosely or left uncovered under a cage with a light dressing over the ulcer. The local treatment is the same as that for venous ulcers, though an ointment containing cod-liver oil or irradiated sterol is sometimes useful in the arterial type. Vasodilator drugs are worth a trial. Buerger's postural exercises should be given a trial.

UROLOGY.

Differentiation between Hyperplasia and Carcinoma in Cushing's Syndrome.

F. HINMAN, JUNIOR, H. L. STEINBACH AND P. H. FORSHAM (*J. Urol.*, March, 1957) report on hormonal excretion studies and skiagraphy in distinguishing adrenal hyperplasia from either adenoma or carcinoma in 20 cases of Cushing's syndrome surgically treated. Baseline determinations of 17-hydroxycorticoids, and determinations after stimulation with ACTH in 14 cases of hyperplasia and four cases of adenoma, showed that a resting level of over 12 milligrammes per day was suggestive of Cushing's syndrome, while post-stimulation levels of over 50 milligrammes per day were definitely diagnostic. On the contrary, in two cases of proved carcinoma stimulation produced no significant rise in the high basal 17-hydroxycorticoid level. The 17-ketosteroid excretion was also studied, but alterations were of less magnitude and importance for the diagnosis of Cushing's syndrome than in syndromes consisting primarily of virilization. There was no correlation between the degree of maximal adrenal hyperactivity as measured by the stimulation tests and the size of the "hyperplastic" gland removed at operation. Therefore the urologist cannot estimate abnormal cortical activity either from diagnostic pneumography or from the gland size at operation. The diagnosis of Cushing's syndrome therefore rests on clinical observation and steroid excretion studies. Presacral pneumograms were very helpful; of especial value was the observation of a rounded mass on the affected side with adrenal atrophy on the other.

Results of Nephrectomy for Hypertension.

G. J. THOMPSON (*J. Urol.*, March, 1957), of the Mayo Clinic, has made a study of 337 cases in which a combined diagnosis of hypertension and severe unilateral renal disease was made, and in which nephrectomy was performed at the clinic over a 15-year period. A much better response was secured (as regards reduction of blood pressure) in the atrophic group than in any other groups of severe unilateral disease. The author comes to the conclusion that nephrectomy should be performed for the hypertensive patient

who has severe disease in one kidney and whose other kidney is normal, provided that other conditions which might prevent operation are absent. Nephrectomy provides permanent reduction of blood pressure to normal levels in about 50% of patients with an atrophic kidney, and in about 25% of patients with other surgical renal diseases, except neoplasms.

A Clinico-Pathological Study of Uretero-Pelvic Obstructions.

R. LICH, JUNIOR, AND M. J. BARNES (*J. Urol.*, March, 1957) have made an intimate study of the types of uretero-pelvic junction obstructions in which extrinsic factors seem to be all-important, yet the evolution of the case shows that this is not so. At operation it is often noticed that removal of an aberrant vessel or of adhesions does not allow efficient emptying of the renal pelvis, even under manual compression. It is notorious that in most instances dilatation of the ureter from below by ureteric catheter does not bring anatomical or functional improvement; even dilatation from above at operation does not mean that functional patency will ensue. In performing a test at operation, if the renal pelvis is not distended at the moment, functional obstruction (or patency) can be determined by injecting saline solution into the renal pelvis with a syringe and needle. Since functional patency was not always obtained after removal of extrinsic causes of obstruction, it was assumed that some factors, not clearly evident, were in operation. It was therefore decided to launch a study, which has now spread over several years. This was to excise the uretero-pelvic junction and a portion of the upper part of the ureter, and perform reanastomosis of the top of the ureter to the tip of the renal pelvis. The results have been gratifying, and the cause of obstruction has been found to be very fine valvular formations on the ureteric wall, which obstruct the downward flow of fluid. This occurs very frequently, and this state of affairs was not determined for certain until microscopic study of cross-sections of the ureteric wall were replaced by examination of longitudinal sections. There were certain technical difficulties in achieving success with longitudinal sections; but when those were overcome, it was demonstrated that certain delicate finger-like processes had a valvular obstructive effect against descending fluid.

Renal Papillary Necrosis.

H. B. SIMON, W. A. BENNETT AND J. L. EMMETT (*J. Urol.*, April, 1957) state that renal papillary necrosis is a relatively uncommon clinical entity. Not until Gunther, in 1937, emphasized the association with diabetes did its importance become recognized in the literature. There are several underlying factors. Normally the pyramids have a poor vascularity compared with the rest of the kidney; compression of the pyramidal blood vessels by inflammatory exudate in pyelonephritis or by increased intrapelvic pressure in distal obstruction is a factor. Forty-two patients with renal papillary necrosis came to necropsy at the Mayo Clinic in the 21 years between the

beginning of 1934 and the end of 1954. In the literature generally most patients have been diabetic, but in this series, surprisingly, 81% did not have diabetes. The clinical manifestations are very variable, but the disease is usually fatal. The symptoms are usually masked by those of the primary disease, and the correct diagnosis is rarely suspected *ante mortem*. Sometimes the diagnosis is established by nephrectomy, and occasionally such patients survive, if the disease is unilateral. In the subacute type, the development and progression of renal infection are slow, and the increase in blood urea level is progressive; oliguria and finally death occur. In the acute type there are fever, septicemia and rapidly progressing azotemia, coma and death. In an analysis of all the cases in the series the commonest combination of factors serving to deplete the pyramidal blood supply and to result in papillary necrosis was acute pyelonephritis accompanied by vascular changes. The dangers are when distal obstruction or diabetes is present. The fatal nature of this disease emphasizes the importance of prevention rather than treatment. Early recognition and prompt treatment of acute pyelonephritis in both diabetic and non-diabetic patients are essential. Also, distal obstruction must be relieved and diabetes controlled.

HYGIENE.

The Danger of Dermatoses due to Cold-Setting Ethoxyline Resins (Epoxide Resins).

E. GRANDJEAN (*Brit. J. Indust. Med.*, January, 1957) has investigated hazards associated with the use of a new group of synthetic resins (the ethoxyline or epoxide resins). Most of these are aliphatic-aromatic polyethers containing hydroxyl and terminal epoxy groups. Highly reactive hardeners used are usually polyamines. These resins are used in industry and have recently been made available to the public. The alkaline hardener is a primary irritant. The resulting dermatoses are described. The initial stage is erythematous itching patches. The second stage appears to be due to sensitization to the resin and hardener, and is characterized by a papulo-vesicular eruption. In 11 factories making electrical equipment, the work benches and the workers using "Araldite casting resin D" were investigated. Out of 328 workers, 164 showed dermatoses (erythematous itching patches) and severe allergic eczema caused by direct contact either with the liquid "Araldite resin D" or with "Hardener 951" (triethylenetetramine), or with a not already polymerized mixture of both. The preventive measures are discussed in detail. These include: (i) instruction of workers and foremen; (ii) action directed towards eliminating the hazard of the contaminated work bench, cleaning rags, solvents and containers; (iii) removal of vapours by exhaust ventilation; (iv) individual protection of the skin; (v) care of the skin; and (vi) medical measures.

Brush Up Your Medicine.

THE CARE OF THE EYES OF THE NEWBORN BABY.

The care of the eyes of the newborn baby commences at birth before the cord is tied, the aim being to prevent *ophthalmia neonatorum*. To many, the term *ophthalmia neonatorum* immediately suggests gonococcal infection; but by definition, *ophthalmia neonatorum* is any inflammation of the eyes occurring in the first fourteen days of the baby's life.

It is instructive to review briefly the methods which have been advocated to prevent *ophthalmia neonatorum* before attempting to outline a definite prophylactic procedure.

In 1880 Credé introduced his method of prophylaxis—namely, the instillation of 1% silver nitrate solution into each eye, to be followed by irrigation with saline. Although there are certain drawbacks to the use of silver nitrate, no serious attempt to supplant its use had been made until the last ten years. Even so it still has its advocates and may be indicated under certain conditions. The value of silver nitrate in the prevention of blindness due to *ophthalmia neonatorum* has been inestimable, and it is certain that this procedure has done more than any other to reduce the incidence of blindness in childhood.

If this is so, then why should attempts be made to supplant its use? Objections to the use of silver nitrate are four: (i) It may cause a conjunctival reaction. (ii) It may cause conjunctival hæmorrhage. (iii) It may produce corneal opacities. (iv) It is not absolutely reliable in preventing ophthalmia.

The advocates of silver nitrate contend that these reactions will not be seen if a freshly prepared solution is used, the reactions being due to concentration and formation of free nitric acid, which occurs in stock solutions. To overcome this they advocate the use of silver nitrate freshly prepared and kept in a beeswax container, each container holding enough solution for one patient.

It has been estimated that some 20% to 30% of babies who receive silver nitrate prophylaxis develop sticky eyes, and about half of these become contaminated with staphylococci. The condition is ordinarily self-limited. The following factors help to produce this state of affairs: (a) Free nitric acid may prepare the epithelium for bacterial invasion. (b) Neutralization and removal of excess silver nitrate is not universally practised. (c) Bacteria may be introduced during the process of prophylaxis.

The first factor can be overcome by using freshly prepared solution, the second by careful irrigation of the sac with saline, and the third by careful and thorough swabbing of the lids and lashes before the baby opens his eyes. Every child is born through a contaminated field, but the conjunctival sac is not exposed to infection until the child opens his eyes. Some workers have shown that cultures taken from the eyelids of 100 newborn babies immediately after birth and before the cord was cut produced a positive result in 96, the main organisms being staphylococci, *Bacillus coli* and streptococci. These figures clearly demonstrate the need for swabbing the lids before the eyes are opened.

With the introduction of the antibiotics silver nitrate was replaced in many clinics by penicillin, and it was hoped that by its use a potent prophylactic would be available without any of the disadvantages of silver nitrate. The strength of the penicillin recommended varies, but 5000 units per cubic centimetre for the solution and 100,000 units per gramme for the ointment are average figures. Three drops of the solution are instilled into each eye after the lids have been swabbed, or ointment is instilled into each conjunctival sac. Even so about 10% of babies do develop some reaction—namely, redness, oedema and discharge. The reports on the use of penicillin were gratifying, and in the Continental literature there still appear reports on its use in the prophylaxis of *ophthalmia neonatorum*. Unfortunately, today penicillin cannot be relied upon either as a prophylactic or as a therapeutic agent because of the tremendously high incidence of penicillin-resistance. The resistance of organisms to antibiotics has created a state of affairs in which a gonococcal infection may be more amenable to therapy than some staphylococcal infections.

As an endeavour to jump the hurdle of penicillin-resistance, other drugs have been used for prophylaxis of ocular infection at birth. "Aureomycin" in a 0.5% solution

has been recommended to be instilled into each eye after the eyes have been swabbed with saline. The results of treatment with "Aureomycin" were good and gave better results than a control series in which silver nitrate was used.

Recently one worker decided to compare the results of prophylaxis with silver nitrate and those in a control group in which the lids were swabbed with normal saline. In neither group did a severe infection occur, and all babies left hospital with clean eyes. It was concluded that there was no absolute indication for the use or disuse of silver nitrate. However, should a case of purulent ophthalmia occur, its cure by modern methods is almost certain, and there is thus no actual need for prophylaxis.

It is recommended then that where there has been adequate ante-natal care of the mother and where confinements are carried out in a modern hospital, the prophylaxis of *ophthalmia neonatorum* should be swabbing of the lids of both eyes at birth, before the baby opens his eyes. However, where the mother has had no ante-natal care and in primitive conditions, the use of silver nitrate is desirable. When a sticky eye develops, the procedure should be preparation of smear and culture followed by frequent swabbing and irrigation of the eyes with saline. If there is no response in four days, the antibiotic to which the offending organism is sensitive should be instilled. Where facilities for performing a sensitivity test are not available, streptomycin is the drug of choice. Professor Ida Mann has shown that in the series which she studied all organisms causing *ophthalmia neonatorum* were sensitive to streptomycin.

Inclusion Blepharitis.

From time to time babies will be seen whose eyes manifest no inflammatory change until about one week after birth, when a moderate to severe papillary conjunctivitis with abundant purulent discharge occurs. Occasionally the disease is very severe with pseudo-membranes and simulates gonorrhoeal ophthalmia. The disease referred to is known as inclusion blepharitis. It is seen in other age groups as well and is also known as paratrachoma and swimming-pool conjunctivitis. A diagnosis can be suspected on clinical grounds and is confirmed by the finding of inclusion bodies.

The normal habitat of the virus of inclusion blepharitis is the cervical epithelium of the female and the urethral epithelium of the male. In the newborn, infection of the eye occurs during passage through the birth canal.

Treatment is eminently satisfactory, cure being effected by local application of the sulphonamides.

Congenital Dacryocystitis.

Congenital dacryocystitis is an inflammation of the tear sac, which is commonly founded on a congenital basis, depending on a developmental obstruction of the lachrymal passages.

The affection may be unilateral or bilateral and is frequently observed soon after birth, when a chronic purulent discharge is found to issue from the eye. This may be mistaken for conjunctivitis, but pressure on the sac usually produces a copious regurgitation of mucus, and often swelling over the sac eventually appears.

Treatment should consist of massage over the sac and the instillation of antiseptics or sulphonamides. If cure has not been attained by the age of three months, the tear passages should be probed.

Conclusion.

Finally, the care of the newborn baby's eyes should include a thorough examination of the lids and eyes to eliminate the presence of any congenital abnormality. The lids should be examined for deformity, such as notching, and the globe examined for deformities of the cornea—one larger than the other or steamy in appearance suggesting congenital glaucoma. The iris should be examined for any obvious irregularity, i.e., colobomata, and the pupil to note the presence or otherwise of an opacity therein suggesting cataract. It is better that abnormalities be discovered before the baby leaves hospital than that attention should be drawn to their presence by a distracted mother after she returns to her home.

Sydney.

R. HERTZBERG, F.R.A.C.S., F.I.C.S.

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British Medical Association.

THE HENRY SIMPSON NEWLAND PRIZE IN SURGERY.

We have been asked to announce the following conditions relating to the Henry Simpson Newland Prize in Surgery for 1958. The subject for the essay is "Factors Influencing the Prognosis in Acute Intestinal Obstruction". The essay must not exceed 50,000 words in length, and must be type-written or printed in English. The competition is open to any graduate of any medical school within the British Commonwealth. All essays must be delivered to the General Secretary of the Federal Council of the British Medical Association in Australia, 135 Macquarie Street, Sydney, not later than November 23, 1957.

Medical Societies.

THE MEDICAL SCIENCES CLUB OF SOUTH AUSTRALIA.

A MEETING of the Medical Sciences Club of South Australia was held on August 2, 1957, at the Anatomy Department, University of Adelaide.

Cytoplasmic Particles and Their Activities.

R. K. MORRISON discussed the significance of enzymic activities of isolated cellular particles in the light of present knowledge of cell structure. Electron micrographs showed details of the fine structure of plant and animal cells, particularly of the mitochondria and the endoplasmic reticulum. It was demonstrated that many commonly-used methods of isolation of cell components led to loss of fine structure and associated changes in enzymic activities. Evidence for the origin of microsomes from the endoplasmic reticulum of both plant and animal cells was described. The quantitative and qualitative aspects of enzyme localization on cell structures were discussed, particularly in relation to methods whereby the activities measured might be regarded as an expression of the in-vivo activity. The speaker said that a new approach to that problem had been developed, isolated intact animal cells being used. He emphasized the need for the biochemist to remember that the aim of his work was to explain the activities of living cells in terms of physics and chemistry.

Out of the Past.

In this column will be published from time to time extracts, taken from medical journals, newspapers, official and historical records, diaries and so on, dealing with events connected with the early medical history of Australia.

PROPOSED MEDICAL CONGRESS IN SOUTH AUSTRALIA.

[From the *Australasian Medical Gazette*, October, 1886.]

THE action of the South Australian Branch of the British Medical Association in initiating a movement for the holding of a Medical Congress in Adelaide during the spring of next year is worthy of all praise. The period at which it is to be held is fixed at about the time of the opening of the Jubilee Exhibition to be held in that city in 1887, and this will, doubtless, add to the interest of the affair. A meeting of representatives of the whole medical profession of Australia cannot fail to be of advantage not only to our own body but to the people generally. Our surroundings are so different from those of older countries that a comparison of experiences by observant men will lead to discussion which must result in good. It will keep up that feeling of brother-

hood which should always exist amongst medical men of all countries, and which is the more essential when they belong to colonies the offspring of one great Empire. We hope that our readers and these include all the leading men in Australasia will not lose sight of the fact that the credit of medicine on this side of the world will be in a great measure bound up with the success of this the first Medical Congress held here and that it is the bounden duty of us all to aid the movement with our utmost ability. Good papers should be written for choice on subjects peculiar to our practice at the Antipodes so that the proceedings will possess a novelty which will excite more attention in the older countries than if they were written on subjects common to themselves. It may also be a stepping stone to the formation of an Australasian Medical Association, an institute which we think could be of infinite advantage, and more limited to our circumstances than the existing connection with an Association at the opposite side of the world. Dr. Doulton of Adelaide is the Honorary Secretary of the Congress Committee and he will be happy to furnish particulars to any gentleman wanting information.

Special Correspondence.

LONDON LETTER.

Research into Rheumatism.

THE annual report of the Empire Rheumatism Council contains examples of important discoveries made by research workers which are likely to have far-reaching effects on the treatment of rheumatism. Until recently, the muscles of the body were regarded as a bundle of fibres of much the same character; but with the aid of the electron microscope, it has been established that muscle contains many different varieties of fibres. Another discovery is the isolation of a new substance, chondroitin sulphate complex, in the fluid surrounding muscle and ligaments. The changes which may occur in this new compound and surrounding fluid under various conditions of heat and cold are being studied, and the answers may produce remedies of considerable benefit to sufferers from rheumatism. Appeals for funds to continue research into rheumatism are being made on a national scale. All the principal industrial firms in the United Kingdom are being approached, as rheumatism accounts for more absenteeism than industrial disputes.

Hospital Building and Finance.

Speaking at the conference of the Institute of Hospital Administrators at Torquay recently, Sir Harry Platt, President of the Royal College of Surgeons, declared that unless the present system of financing hospitals was changed, he had come to the regrettable conclusion that the British hospital building programme within the next 29 years would not compare with the rest of Europe and North America. At the present time, the medical profession was attempting to practise twentieth century medicine in nineteenth century structures. Scandinavia, Switzerland and France had built many new hospitals since the war, which were financed out of local loans. In the United States of America hospital construction was a major industry, old buildings being ruthlessly demolished to make room for new ones. In Canada, the same activity prevailed. Sir Harry Platt thought that the effect of the present discontent of the medical profession in Britain might influence public opinion towards a complete review of the system of administration and finance in the hospital service.

Medical Training.

New recommendations for the training and examination of doctors have been approved by the General Medical Council in London. There will be no reduction in the existing five-year minimum of the curriculum. The Council specifies 10 subjects in which candidates should be examined, compared with the previous 15. The periods to be given to particular subjects, their sequence and the scope of instruction are to be left to the discretion of medical schools and examining bodies. It is thought that these recommendations will give greater opportunities for experiment and initiative, and although no operative date is specified, it is hoped that medical schools and licensing bodies will review their curriculum as soon as possible.

Poliomyelitis Vaccination.

Over 1,900,000 children between the ages of three and ten years were registered in Great Britain in 1956 for vaccination against poliomyelitis. Up till April, 1957, sufficient vaccine had been produced in this country to vaccinate about 750,000 of them. Only one firm has so far been producing the British vaccine, which must pass the most stringent tests. A second firm may be coming into production shortly.

It has been decided, on the advice of an expert committee, of which Lord Cohen is chairman, to continue poliomyelitis vaccination during the summer months. Last year the programme ceased at the end of June, but since then, convincing evidence of the safety of the vaccine has been obtained. No cases of poliomyelitis have occurred in vaccinated children which could be associated with the actual inoculations. Further, there is the longer experience of the public health authorities in America, who have failed to find evidence of vaccination provoking paralysis. In America, vaccination is continued throughout the year.

Vaccination is now offered to further age groups of children—that is, those born in 1955 and 1956.

There has been a certain amount of agitation here in the medical and lay Press to influence the Government to import the American or Salk vaccine in order to speed up the vaccination programme, but this has been resisted. The main reason given is that American vaccine does not receive the same warranty of safety as the British product receives from the Medical Research Council. A second reason for caution is that the potency of different products made by different manufacturers varies, and it would be necessary to specify which brands were wanted here.

Virus Research.

What is claimed to be the first of its kind at any British university is the establishment of a new Department and Chair of Virology at Glasgow University. The creation of this department is by means of a grant of £200,000 from the Scottish Hospitals Endowments Research Trust, which administers funds of more than £2,000,000 inherited from the Scottish Voluntary Hospitals on their nationalization. The department is expected to function in 1960 and to become fully effective in ten years. Besides fundamental studies similar to those carried out in Melbourne, Harvard and Yale, the work at Glasgow is likely to focus on latent infections—e.g., measles and viruses least understood by medical science. The more common viruses—poliomyelitis, influenza, the common cold and smallpox—as well as animal and vegetable virology may be left largely to special research units already established elsewhere. The first occupant of the chair has yet to be chosen.

X Rays and Leuchæmia.

The annual death rate from leuchæmia in England and Wales has shown a steady rise from 17 per million in 1931 to 49 per million in 1954. Similar trends have been noted in other countries.

The well-known effect of radiation in producing leuchæmia has focused attention on the possibility of a correlation between the increased incidence of leuchæmia and the corresponding increased use of X rays in medicine. This aspect has been studied by Court-Brown and Doll at the request of the Medical Research Council. Their report, "Leukæmia and Aplastic Anæmia in Patients Irradiated for Ankylosing Spondylitis", is regarded as the most substantial contribution to date on the relationship between exposure to radiation and a recurrence of ill effects. From a study of more than 13,000 patients treated with X rays for ankylosing spondylitis, it is shown that the mortality was about ten times greater than in a normal population of the same age and sex distribution. The authors conclude that it is reasonable to ascribe the majority, if not all, of the excess deaths from leuchæmia to ionizing radiation, and that some, but not all, of the increase in leuchæmia in recent years is due to X rays. They consider that the incidence of leuchæmia is directly proportional to the dose received by the bone marrow, and that this relationship applies even to the lowest dose of radiation. The risk to the individual from exposure to the small doses of radiation used in diagnostic radiology would be so minute that it could almost always be ignored; yet the increasing use of X rays (estimated at 12% per annum) must be considered as a possible contributory cause of the rise in mortality from leuchæmia.

The protection of staff in radiological work in hospitals has been the concern of the Radioactive Substances Advisory Committee, which advises the Government on general prob-

lems of protection arising out of the use of ionizing radiations. This scientific body, whose chairman is Sir Charles Darwin, has now issued a comprehensive manual or code of practice, relating to the technical safeguards necessary to ensure adequate protection to those who work with X-ray apparatus as well as radioactive isotopes. It is a detailed working manual containing as much of the latest information as possible, and should be applied in all radiological and radiotherapeutic departments in hospitals.

Correspondence.

"MT. WILGA" REHABILITATION CENTRE, HORNSBY: VISIT BY ANCILLARY STAFF.

SIR: I should like to make it known that on Saturday, August 31, 1957, some one hundred and twenty almoners, therapists and limb-fitters visited the above-named Centre by invitation. For the most part the visitors were members of the staffs of the main metropolitan and district hospitals of Sydney, and the cooperation of the superintendents of these hospitals and other institutions in facilitating the invitations is gratefully acknowledged.

It is regretted that unavoidably the invitations had to be extended at somewhat short notice, but it may be anticipated that another similar visitors' day will be arranged at a suitable time in 1958.

This letter is written for the information of members of the profession who may come to learn from their ancillary staffs of this recent "therapists and almoners" day.

Neither this recent occasion, nor the forthcoming clinical programme for the profession (to be held on Saturday, November 16, 1957) should be construed as an official opening of the centre, concerning which matter relevant announcements will be made in due course.

Yours, etc.,

Department of Social Services, R. I. MEYERS,
77 York Street, Senior Medical Officer.
Sydney.
September 2, 1957.

A REHABILITATION CENTRE AT ROYAL SOUTH SYDNEY HOSPITAL.

SIR: Would you kindly allow me space in your columns to inform medical practitioners that the rehabilitation centre of this hospital is now able to accept patients on the recommendation of their own doctor, who should address such requests to the undersigned.

Yours, etc.,

A. C. BOWRING,
Medical Superintendent.

Royal South Sydney Hospital,
Joynton Avenue,
Zetland.
September 2, 1957.

MEDICINE AND THE LAY PRESS.

SIR: Permit me space in your column, to express my abhorrence of the publication by the lay Press of summaries of articles appearing in our journal.

Since Dr. F. J. Kyneur's article on the psychiatric side-effects of the rauwolfia hypotensive agents last week, I have had two of my patients whose blood pressures are well stabilized on a drug that does not contain rauwolfia, telling me that they feel that they are going mad when they take their tablets, and have been pestered throughout the last week by other patients who ask me if they are on the tablets that make people insane.

This embarrassment, and the near-panic which has resulted from the *Staphylococcus aureus* scare associated with the influenza epidemic, has been a source of considerable annoyance to myself as well as other practitioners, and supports the view that the less people know about their

¹See notices in forthcoming monthly notices of the New South Wales Branch of the British Medical Association.

illnesses, the better for themselves and their medical advisers.

There are very few patients who are sufficiently intelligent and clinically wise to use information about disease to their advantage. We are all familiar with the increased difficulties when such people as medical students, nurses and lay medical personnel, with varying amounts of knowledge and little or no clinical experience and judgement, have to be treated.

If the lay Press is to be allowed to corruptly educate people who can never hope through experience to possess any clinical judgement, we doctors are surely going to be faced with a dilemma never envisaged by the late Mr. George Bernard Shaw.

Yours, etc.,

Emmaville,
New South Wales,
August 22, 1957.

RICHARD PATERSON.

SIR: Among the Press cuttings sent to me re the Press campaign anent the protection of the public from the evil effects of rauwolfia drugs, there were some more about staphylococcal pneumonia. Surely the next campaign will be one against death. Why cannot the doctors keep people from dying?

Yours, etc.,

Commercial Bank of Australia,
Piccadilly,
London.
August 23, 1957.

CEDRIC SWANTON.

GUAIALCOL-GLYCEROL-ETHER: A TRANQUILLIZING DRUG.

SIR: I have read with interest letters concerning gualiacol-glycerol-ether, from Dr. Vann, Mr. Quinn and Mr. Easterbrook, published recently in your correspondence columns.

I have been using this substance for almost three years in my psychiatric practice, and have found it extremely useful for its tranquillizing properties in the treatment of anxiety neurosis, particularly those with tension headaches. It has proved to be helpful in the ante-natal anxiety state, and is sometimes preferable to other drugs when there is a possibility of disturbed liver function. Alcoholics often respond well to gualiacol-glycerol-ether during the withdrawal period and in their subsequent psychiatric treatment. Again, it is often preferable to other substances when liver dysfunction is suspected. Modern tranquillizing drugs hold a very important place in present-day treatment of the anxiety neuroses, and I would like to include gualiacol-glycerol-ether in this group.

So far I have not yet had any report of excessive expectation from patients using this substance, but then many anxiety neurotics complain of a dry mouth as one of their symptoms.

Yours, etc.,

J. H. HURT, M.B., B.S., D.P.M. (Eng.)
33 Collins Street,
Melbourne,
August 28, 1957.

LUPOID HEPATITIS.

SIR: Owing to my absence overseas, it was only today that I saw the reply by Dr. Mackay and Dr. Taft (M. J. AUSTRALIA, July 13, 1957) to our contention that high doses of steroid were indicated in the treatment of "lupoid hepatitis".

Firstly, so that there shall be no misunderstanding, my conception of "lupoid hepatitis" is a hepatitis occurring in a patient whose medical history has been studded previously by episodes of the protean disorder we know as systemic lupus erythematosus, or a case which exhibits the L.E. cell, leucopenia, dysgammaglobulinemia or a suggestive liver biopsy. It is in this type of case we contend high steroid dosage should be tried.

As evidence in support of this idea I offer a recent experience. On July 15, at the Prague Central Hospital, I saw a patient suffering from systemic lupus erythematosus with acute hepatitis, who was in extremis. She was under the care of the professor of dermatology, Professor Obrital, who stated that on the advice of the consulting physician,

steroid therapy was kept at the low dosage of 75 milligrammes of cortisone acetate a day. Following the suggestion by myself and an Australian colleague accompanying me, the dosage was raised to 400 milligrammes a day. On August 7 I again met Dr. Obrital at the 11th International Congress of Dermatology in Stockholm, where he informed me that following the increased steroid dosage the patient had experienced a complete remission, and that the response was dramatic.

Yours, etc.,

Commercial Bank Chambers,
17 Bolton Street,
Newcastle.
August 29, 1957.

W. H. WARD.

THE TREATMENT OF SEVERE TETANUS.

SIR: Your issue of August 17, 1957, contains two references to the treatment of severe tetanus. On page 249, modern writers commence their article with the words: "Prior to 1954 all really severe cases of tetanus were fatal." They then proceed to describe the combined exertions of many departments of a well-equipped hospital, supported by the very latest medicamenta.

On page 263, "Out of the Past", is described a case treated in 1870 with croton oil, calabar bean and brandy.

In each instance, the end-result was, happily, identical.

Yours, etc.,

517 Great Eastern Highway,
Greenmount,
Western Australia.
August 27, 1957.

RYAN-MACMAHON.

POST-THYROIDECTOMY TETANY: A REQUEST.

SIR: At the Special Unit for Investigation and Treatment, of the New South Wales State Cancer Council, some investigations of calcium and phosphorus metabolism in cancerous and normal patients are being undertaken.

As a control, a patient suffering from tetany following thyroidectomy is required. The patient would need to be in hospital for four days, the purpose of which is to feed a diet of known mineral content and to collect the urinary specimens.

Any medical practitioner who could assist us in obtaining the services of such a patient is requested to communicate with the Medical Superintendent of the Prince of Wales Hospital, Randwick.

Yours, etc.,

Dorchester House,
149 Macquarie Street,
Sydney.
August 30, 1957.

KENNETH W. STARR.

EMERGENCY CRANIOTOMY FOR MIDDLE MENINGEAL HÆMORRHAGE.

SIR: Dr. W. H. Coates is to be congratulated on the successful result achieved by his bedside craniotomy for middle meningeal hæmorrhage (M. J. AUSTRALIA, August 17, 1957). Extradural hæmorrhage can be the most urgent of all surgical emergencies, and any delay in evacuating the clot may be disastrous. Occasionally, as in Dr. Coates's case, even the time involved in preparing the theatre for operation may jeopardize the patient's recovery and prompt action at the bedside is required.

The clinical record of this patient provides, however, striking testimony of the rapid deterioration which may follow lumbar puncture in states of raised intracranial pressure due to an intracranial space-occupying lesion. We are informed that the patient had been irritable and photophobic, but within minutes of lumbar puncture he was deeply comatose with a dilated left pupil. The removal of even a few drops of cerebro-spinal fluid in such cases may precipitate a tentorial pressure cone, and transform the case from one needing careful observation and perhaps semi-elective surgery in the near future, to one requiring desperate speed if the patient's life is to be saved.

As examination of the cerebro-spinal fluid seldom provides information of critical value in regard to treatment in cases

of head injury, it is wiser to avoid lumbar puncture or at least defer it until such time as adequate surgical facilities are readily available.

Yours, etc.,

301 North Terrace,
Adelaide,
August 29, 1957.

TREVOR DINNING.

THE EARLY TREATMENT OF SQUINT.

SIR: Since Dr. Kevin O'Day refers to me in his letter to your Journal of June 15, I think perhaps I ought to make a few comments.

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I heartily agree with Dr. O'Day that squint cases need not remain in hospital for more than a few days after operation. My usual practice when one muscle is operated upon, is to dispense with dressings of any sort and to discharge the patient from hospital on the third day after operation, and when two muscles are operated upon to pad the affected eye for 24 hours only and to discharge the patient on the third or fourth day after operation. Bandaging both eyes for a week is quite unnecessary, although it is at any rate an advance on the old method that was prevalent when I was a house surgeon, namely bandaging both eyes for two weeks.

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Yours, etc.,

6 Chesterfield Street,
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August 29, 1957.

T. KEITH LYLE.

References.

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Obituary.

SAMUEL PEARLMAN.

Dr. R. H. von der Borch has prepared the following appreciation of the late Dr. Samuel Pearlman.

Dr. Samuel Pearlman was taken from his family and friends with dramatic suddenness on May 5 of this year. Many of us had seen and spoken with him only hours

before, and the shock we suffered could only emphasize the catastrophic blow to his beloved family.

Samuel Pearlman was born in 1903 in Sydney, and spent his early years in the country of New South Wales, where his parents owned land.

His secondary education was undertaken at the famous old Fort Street School in Sydney, where he showed academic brilliance eventually leading to a scholarship which enabled him to undertake medical studies at the University of Sydney. During both school days and university years he was a keen rugby player, making the "Firsts" team at both institutions.

He graduated M.B., Ch.M. in 1925, did *locum tenens* and relieving general practice work until 1929, and then one year as resident medical officer at Lewisham Hospital. From 1930 to 1934 he was, apart from a short term in Liverpool, New South Wales, Superintendent of the General Hospital in Tullamore and district. At the end of 1934 he departed from Tullamore for overseas study in England. The farewell tendered him by a large gathering of people from Tullamore and district, the report of which I have read, showed that the pattern of his later life was then evident; he was proving himself both a popular and able medical man, and was held in warm regard by everybody.

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Samuel Pearlman built up a large practice in both specialties, and the quality and variety of his interests and abilities were well expressed in the articles he published, and the various papers and discussions at branch meetings. His services to the community were many, chief among them being his long term at the Adelaide Children's Hospital: Clinical Assistant to the Ear, Nose and Throat Department, 1937; Honorary Assistant Surgeon from 1938 to 1946; Honorary Ear, Nose and Throat Surgeon from then until his death. During this same period he was Assistant in the Ophthalmological Department at the Royal Adelaide Hospital until 1948, and Assistant Surgeon until 1953, after which time he devoted his full interests to the Children's Hospital. He was chairman of the honorary staff during 1955-1956 and staff representative to the Hospital Board of Management. As well, he was Consultant Aural Surgeon to Mareeba Babies Hospital and President of the Society for Better Hearing.

He offered himself unreservedly for war service, but was deemed medically unfit, being plagued for many years with an intractable tinnitus and deafness following a head injury at football. However, during the war years he did a prodigious amount of work, replacing at least two men on active service, and performing many emergency operations at night after long hours in his North Terrace rooms and routine duties at the Children's and Adelaide Hospitals. Dr. Pearlman's efforts during the war years could in themselves be worthy of special description.

Sam Pearlman's way of life can best be underlined by a description of some of his outstanding qualities. He showed great devotion to his calling, and an ability to keep abreast of the latest developments in his specialties. His immediate attendance at the Children's Hospital whenever needed, and his many brilliant endoscopic achievements and able handling of other emergencies, remain as a memorial to the man of medicine that he was. His calm and gentle manner were an expression of the true inner person; never was his voice heard in criticism of his fellows, and he could always find time to help others. Not only during operative sessions would he devote his time to teaching the resident staff, but he would on occasion come back at night to help further with their problems.

His liberality was paramount; two examples will illustrate this quality. During the war years, he not only kept together much of the practice of the writer, despite the burden of his own numerous commitments, but in addition paid into my account a number of very welcome cheques. No doubt, too, I was not the only one so helped. The other example came soon after the war. A surgeon, discharged after long service in the Navy, was unable to find rooms in which to resume practice. Sam Pearlman, when approached, gave an unhesitating welcome for this man to share his not over-spacious accommodation, being well aware that he himself must suffer some inconvenience.

Finally, Sam Pearlman was above all a devoted family man. He revelled in the athletic achievements of his school-boy sons. As much as he loved golf, which he played with expected good nature, he would at any time sacrifice the game to watch his boys at play. He leaves a widow and a family of five—three boys and two girls. Robert and Rex are medical students, the others are at college.

The months that have elapsed since Sam left us have not dimmed our memories of the man we held in affectionate regard, nor will he be forgotten by those fortunate enough to have known him and enjoyed his friendship.

GEORGE ARTHUR WILLIAM JOHNSTON.

We are indebted to Dr. F. C. Courtice for the following appreciation of the late Dr. George Arthur William Johnston.

The sudden death of Dr. G. A. W. Johnston on May 19, 1957, at the early age of 45 years, came as a shock to his many friends, and especially to his colleagues in the Kanematsu Institute of Sydney Hospital, where he had been Bacteriologist and Assistant Director for several years.

George Johnston was born in Cairns in North Queensland, and in his boyhood days he acquired a love of the sea that never dwindled. He was also fond of music and learnt the violin, but this he gave up when he began to study medicine. He graduated in medicine at the University of Sydney in 1937, and was appointed resident medical officer at Sydney Hospital. In 1939 he was a medical resident officer at the Women's Hospital, and in 1940 was appointed a Fellow in Medicine at Prince Henry Hospital. Here he became associated with Dr. F. B. Byrom, from whom he first acquired his interest in pathology and the laboratory in general. During the war he developed this interest further in the Australian Army Medical Corps from 1942 to 1946.

In 1946 Dr. Johnston was appointed Bacteriologist and Acting Director of the Kanematsu Institute at Sydney Hospital, and on the appointment of the present Director of the Institute, he was made Assistant Director. He came to the Kanematsu Institute just after the war in a difficult period in its history, and under his direction the Institute was revived. As Assistant Director he was largely responsible for the administration of the routine laboratories of the Institute until the time of his death. Although he had a keen interest in all branches of pathology, his main interest was in haematology. In 1954 he was granted leave of absence for a year to work in England with Dr. Dacie in the Department of Haematology at the London Postgraduate Medical School, Hammersmith. After his stay there he was awarded a Fulbright Travelling Scholarship, which enabled him to spend some months in America studying haematology before he returned to Australia.

During his eleven years at the Kanematsu Institute, Dr. Johnston did much to hand on his knowledge to others. The resident pathologists benefited considerably from his teaching in haematology and bacteriology, and several medical men in various specialties owe much to him for his ever-willing and helpful advice. He was always ready to assist not only the members of the staff of the Institute, but anyone else who came along with a problem. Besides his actual work in the laboratory, he was keenly interested in the patient and in the clinical side of haematology in general. He believed that a haematologist must always have contact with the patient and be able to discuss all aspects of the disease with the physician. His quiet, friendly nature and his eagerness to assist anyone in need won him the respect of all who knew him.

As Assistant Director of the Kanematsu Institute, George Johnston believed in and strove for certain changes in the status of the salaried medical specialist. He thought that salaried medical specialists should receive the benefits of a superannuation scheme similar to that in universities; when ultimately a scheme was introduced for all hospital employees, he was a keen critic of its inadequacy for the medical specialists. He was also a very ardent advocate of the importance of raising the status of the salaried medical officers. He firmly believed that the salaried pathologists of the Kanematsu Institute should be granted limited rights of private consultant practice such as exists in some other hospitals in Australia and in many parts of the world. He felt that such rights of consulting with physicians would raise the status of the pathologist in the eyes of the members of the medical profession in general from that of a "back room boy" to a colleague of equal standing. He felt so strongly on this point that shortly before his death he resigned from his position in the Kanematsu Institute

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Yours, etc.,

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TREVOR DINNING.

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Those who shared his friendship have gained something that will not die. The sympathy of the medical profession is extended to his wife and two children.

Dr. H. O. LANCASTER writes: I think George was always happier in consultations and teaching than in the laboratory side of his work. His service in the Australian Imperial Force in the Northern Territory and Borneo gave him many such opportunities of cooperation. He was interested, too, during this time in the role of pleuropneumonia-like organisms in the production of non-specific urethritis.

Dr. HENRY SHARP writes: Dr. G. A. W. Johnston, who died suddenly on May 19, 1957, was born in Cairns, Queensland, forty-five years ago, and it was there that he first found that love of the sea which was to be a dominant factor throughout his life. It was as a small boy of ten years that he built his first dinghy and, with sails made from old flour bags, set forth on a voyage of adventure in Cairns Harbour. Later, in his teens, he sought wider horizons, joining fishermen and others on trips to various parts of the Barrier Reef; one such trip was made in a Japanese pearling lugger diving for trochus shell. On another occasion, whilst on vacation, he formed one of the crew of a mission lugger cruising amongst the islands in uncharted waters of the Torres Straits.

After his graduation, the call of the sea led him to make a number of trips as ship's surgeon voyaging to New Zealand, Japan and England. On these trips he took every opportunity of increasing his already extensive knowledge of navigation. He was well known on the New South Wales coast as an ocean racing yachtsman, taking part in three Hobart races; but it was, cruising that he enjoyed most of all. As a crew member he was a most agreeable companion, who loved his yarn around the cabin lamp, but who also possessed that rare gift, given to few, of an understanding silence. George is once more "Outward Bound", may he have fair winds and sunny skies.

HERBERT MAUNSELL HEWLETT.

We are indebted to Dr. Colin Macdonald for the following appreciation of the late Dr. H. M. Hewlett.

Thirty years have passed since the writer of this memoir first became actively associated with Herbert Maunsell Hewlett, whose death on July 26, 1957, at the age of eighty-five years, removed the Nestor of Australian radiology. An outstanding and remarkable man, his name, reputation and address—Melbourne Mansions, 101 Collins Street—were for many years household words throughout the length and breadth of Victoria. And another link is broken with nineteenth century Edinburgh, which strongly influenced medicine in Australia.

Herbert Hewlett, born in Fitzroy, Victoria, in 1872, was the younger son of Dr. Thomas Hewlett, a Berkshire man from Abingdon, one of the most ancient, picturesque and interesting towns on the upper Thames, a few miles below Oxford. Thomas Hewlett, an Army surgeon, came from India to Australia in 1862, settling in the then fashionable suburb of Fitzroy, and for forty years conducted in Nicholson Street, opposite the Exhibition Buildings, a very extensive general practice, during which time he became a prominent social and professional figure in the life of Melbourne, president of the Medical Society and a member of the Medical Board of Victoria.

Herbert, his younger son, was educated under Alexander Sutherland at the Carlton College, long since no more, but then standing in the Royal Parade, Parkville. Sutherland, whom Hewlett held in high regard, was a Scot whose influence—according to Emeritus Professor W. A. Osborne—on the culture of Melbourne, both as an educator and as a writer, was considerable. Many professional men of distinction were taught by Sutherland; he contributed largely to British and local journals, and was the author of an outstanding work: "The Origin and Growth of the Moral Instinct in Man"; after leaving Carlton College he became Registrar of the University of Melbourne. Sutherland succeeded Professor W. E. Hearn as the owner of "Heronswood" on the northern slopes of Arthur's Seat overlooking Port Phillip Bay, and Hewlett would speak of happy week-ends with his schoolmaster at this delightful property. It is of interest to recall that in the study at "Heronswood" were written, by its three successive owners, three great books, which had a considerable impact on sociological

thought. Hearn wrote, amongst other volumes, "The Governance of England", Sutherland his notable work on the moral instinct, and its later owner, Mr. Justice H. B. Higgins, "A New Province in Law and Order".

After three years of medicine at the University of Melbourne, Hewlett proceeded to Edinburgh, where a galaxy of clinical teachers were assembled, a group of inspiring lecturers and mentors such as the world had probably not before, nor has it since, seen gathered into one medical school. Henry Littlejohn, John Duncan, Joseph Bell (who, it will be readily remembered, inspired Conan Doyle's Sherlock Holmes), Halliday Croom and John Thomson were the Edinburgh giants of those days, and I know that Hewlett was profoundly influenced by their personalities and teaching. John Thomson, lecturer on diseases of children and physician at the Sick Children's Hospital, was then rising in prominence and was Hewlett's favourite teacher, so it was natural that under Thomson's guidance he developed a love of paediatrics. Thomson was a medical discoverer of new types of disease in children, exercising in a high degree the talents of clinical observation, reflection on what he saw and close attention to current literature. His clinical lectures were also good, with a noble rhetoric added, though reading them today shows how dated they are by the pathology and physiology of their day. Even without a note being taken, his teaching entered into the grain of the professional life of his students, and especially in the fundamental process and art of diagnosis; and Hewlett continued to practise daily through the years the lesson of the master. Amongst his treasured possessions was a large bundle of letters written in Thomson's graceful handwriting, indicating a close friendship persisting until the latter's death; these letters are now in the Museum of Medical History in Melbourne.

Hewlett gained three clinical prizes in Edinburgh and took both its L.R.C.P. and M.R.C.P. in 1896, thus qualifying in medicine a few months after the momentous discovery of the X rays in November, 1895, by Wilhelm Carl Röntgen, Professor of Pure Physics in the University of Würzburg. It was not, however, until the period of the first World War that improved apparatus allowed clinicians and radiologists alike to sponsor, except in very restricted fields, this new method with any degree of confidence. The improvements which achieved so much were the interrupterless transformer, the Potter-Bucky diaphragm and the hot cathode (Coolidge) tube. Hewlett experienced all the uncertainties, vexations and frustrations of those earlier years of the gas tube, the induction coil and the capricious interrupters; but he had infinite confidence in the future of medical radiology, and eagerly seized upon and developed every practical and theoretical advance with an enthusiasm which never left him. He would relate how, after the announcement of their discovery, extraordinarily sinister qualities were attached to the rays, and it was believed that evilly-disposed persons could carry X rays on their persons and betray in broad daylight the secrets underlying lingerie, thereby giving grave concern to stern-minded people; how, in February, 1896, Congressman Read introduced a Bill into the New Jersey Legislature prohibiting the use of X-ray opera glasses, and how this Bill provided substantial penalties for those who, all unsuspected by the ladies of the chorus, would penetrate the thin veils—of course much thinner today—of theatrical modesty.

On returning to Australia, Hewlett entered into partnership with his father in the family general practice at Fitzroy, which lay just across the Exhibition gardens from the Children's Hospital, whose surgical staff he straightaway joined. The then leader of the Children's Hospital staff was William Snowball, for whom Hewlett quickly developed a great admiration. Hewlett had always been interested in photography, and it was Snowball who persuaded him to become the hospital's first skiagraphist; the complete apparatus cost at that time approximately £100. The title of skiagraphist was later changed to radiologist, and he occupied this position until his retirement in 1936. From 1914 onwards he confined himself to radiology. He was also honorary radiologist to St. Vincent's Hospital, Melbourne, for over twenty years, and his name will always be associated with the foundation and development of the X-ray departments of both these important hospitals. He was elected an Honorary Fellow of the Faculty of Radiologists, London, as well as of the College of Radiologists of Australasia. In 1907 he was president of the Melbourne Medical Association (dissolved some years ago, to the regret of many).

Hewlett was not a fluent speaker, and he contributed little to medical literature; most of his wisdom was distilled in the darkened X-ray room—waiting for eyes to become

accommodated before fluoroscopy—to those few who were privileged to work with him.

One of the outstanding European radiological pioneers was the Frenchman, Antoine Bécère, in whose memory was founded, in 1950, at 7 rue Perroult, Paris, the Antoine Bécère Centre, for the promotion of international relations in medical radiology. On the roll of honour of the names of famous pioneer radiologists is inscribed that of "H. Hewlett, *Australie*"; this inscription gave him greatest satisfaction, and was regarded as setting a seal on his reputation.

After he had passed his sixtieth birthday, Hewlett was on the verge of dying from bronchopneumonia. There were no sulphonamide drugs and no penicillin in those days, and it was regarded as little short of a miracle that he pulled through. Yet, after a brief trip to the Far East, he rose phoenix-like, and worked almost as hard and as well until eighty years of age. He was in the latter part of his working life a member of the Melbourne Radiological Clinic partnership.

For the first fifteen to twenty years after Hewlett commenced X-ray work, little was understood of the need for protection, and in later life he suffered uncomplainingly from a troublesome and painful radiodermatitis of both hands; but his general health did not appear to wilt under the strain of performing up to a dozen barium meal X-ray examinations daily, in addition to numerous other examinations, every one of which had to be conducted with the same care and thoroughness.

To what were Hewlett's high reputation and success due? I believe that two influences more than others helped to shape his personal and professional life. The first was his father, and the other the Edinburgh Medical School. From his English father, he absorbed an abiding loyalty to the principles of the Hippocratic tradition, medical ethics, and the social amenities. The son, as did the father, believed that if a man or woman entered the ancient and noble calling of medicine, certain standards of professional and social conduct were demanded, and that no effort should be spared that these canons should be maintained. His speech, his manners, his dress, all proclaimed him a man of taste and social sense. The influence of his Scottish teachers meant that, while taking full advantage of every advance in radiological equipment and technique (and he had the wonderful experience of living through the whole intensely rich gamut), never for one minute did he lose the clinical and pathological approach to radiological interpretation. He wanted to examine personally every patient and see what manner of human was the man, woman or child sent to him for X-ray investigation. And his report to a clinical colleague was as personal a communication as would be given by an oculist or any other bona-fide specialist. It was this clear concept of the clinical background of diagnostic radiology which was largely the basis of Hewlett's success, and which maintained it, splendidly unbroken, for so long a professional span.

Hewlett had the good fortune, during his early years in radiology, to find a colleague after his own heart in the late Dr. J. F. Wilkinson, a pioneer of gastro-enterology in this country, a really great physician whose name and influence on Victorian medicine should not be forgotten. Hewlett and Wilkinson were a splendid combination, intensely keen and industrious, and it was due to their work that even forty years ago the value of X-ray examination of the gastro-intestinal tract had been firmly accepted by the profession in Melbourne.

Hewlett frequently averred that the only price of technical success in radiography was unwavering attention to every little detail. He constantly counselled young radiologists to see all patients and take their history, always to take films of the opposite side of the region under examination for comparison, always when in doubt to suggest a reexamination in two or three weeks' time (because of the frequent time-lag between the inception of a pathological process and its demonstration on the X-ray film), and always to employ, when investigating the stomach and duodenum, the right-oblique serial views as originally described by Russell Carman of the Mayo Clinic. To Carman's work and writings, Hewlett freely acknowledged his debt. During the twenties and thirties he became very interested in the gastro-duodenal work of the Scandinavians, Forsell and Åkerlund, and of the German, H. H. Berg (with his aimed snapshot compression-dosage technique); but it was to Carman he awarded the palm.

Hewlett was a little under average height, of slight build as a younger man, in latter years inclining to rotundity; he was always immaculately turned out and a lover of the good things of life. The accompanying photograph—by his

old friend Dr. Julian Smith—is a very good one. In 1899 he married Miss Dollie Lincoln and had an extremely happy married life, living for many years in the residential section of Melbourne Mansions, in the basement of which were situated his professional rooms, opening directly on to Collins Street. A gracious and generous host, he was completely reliable, for if he promised to do anything he always did it, and to the best of his ability.

Of Herbert Maunsell Hewlett, it can truly be said that no radiologist in Australia has done more to develop and to maintain the prestige of radiology as a medical speciality, and his name and work will not be forgotten.



No account of Hewlett's life would be complete without reference to the Athenaeum Club in Collins Street East, where his dapper fingers will be greatly missed, particularly around the billiard and card tables. He was one of the club's oldest members, having joined sixty-one years ago, in 1896, and remained for many years on its Committee, until nearly the end of his life. Standing almost next door to the Melbourne Mansions, where he worked and lived, the club proved a great haven after the heavy day's work. Framed in a card room of the Club is a record of interesting poker hands dealt to "Herbie". On December 18, 1941, he was dealt, during the evening, a royal flush in diamonds, and a few minutes later a straight flush in clubs, ace to five. But only a few months before, he had held a straight flush in diamonds, four to eight, twice in one round. An electronic brain would be required to calculate the odds against the holding of such remarkable cards. As time seemed to have passed him by, it is difficult to realize that his spruce figure with its cheery greeting will never again be seen entering the Club lounge, perhaps to discuss the acceptances for the Melbourne Cup or even an unusual case of duodenal carcinoma.

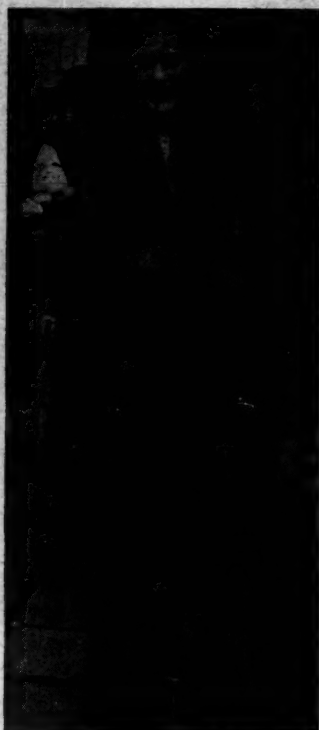
He had a great love of horses, and was a member of the three leading racing clubs. He would frequently recount nostalgically the happy and elegant luncheon parties under the elms at Flemington on Derby Day in the spacious days before the first World War. His *bonhomie* earned him a wide circle of friends outside the profession, and he was always in demand for golfing at the Royal Melbourne Club, Sorrento or Barwon Heads, for a shooting party at the opening of the quail season, or for a fishing excursion to the Tasmanian Lakes, where over many years he had taken

a long summer vacation, with his only daughter Nancy (now Mrs. Clive Currie) as a devoted companion. Hewlett was a first-class shot; from early boyhood he could handle a gun, and he was generally conceded to be one of the best sporting shots in the State.

THEODORA MARGARET ENGLAND.

We are indebted to Dr. Amy Clark for the following appreciation of the late Dr. Theodora England.

Dr. Theodora Margaret England, formerly deputy medical superintendent of Kenmore Mental Hospital, died in Sydney on June 9, 1957. Theodora England, whose father was a lawyer in Tamworth, was born and went to school in that district. She graduated in medicine at the University of Sydney in 1925, and was shortly afterwards appointed as resident medical officer at the Royal North Shore Hospital.



At the conclusion of her term there she joined the Mental Hospitals Department of New South Wales, and after a short term at Kenmore was transferred to Callan Park; there she remained until two years ago, when she went to Kenmore as deputy medical superintendent. Whilst at Callan Park she was appointed to the honorary staff of The Rachel Forster Hospital for Women and Children, and for many years was senior honorary psychiatrist at that hospital. After her departure for Kenmore she was appointed honorary consulting psychiatrist to The Rachel Forster Hospital.

Although she had very little time for her hobbies Dr. England was a keen and good golfer, and until shortly before her death was an associate member of Kensington Golf Club. During the early years of the war she had the tragic misfortune to lose her fiancé in an air crash. This blow she bore courageously and gallantly, in the same way as she faced her own end when it became known to her.

Theodora England's death will be greatly felt by her friends and by her patients. Her care of the latter was untiring, and her kindness is spoken of by patient and nurse alike. She was a most generous and loyal friend. Dr. England is survived by a sister-in-law and niece, the wife and daughter of her brother, the late Brigadier Vivian England.

Dr. Mary C. Puckey writes: Dr. Theodora England, who died on June 9, 1957, at the early age of 55 years, was at the time of her death consulting psychiatrist to The Rachel Forster Hospital. Dr. England joined the staff of Rachel Forster Hospital in 1938, and in spite of being a full-time medical officer at Callan Park found time for patients at Rachel Forster. Her weekly half day off duty was devoted to out-patients, and consultations within the hospital were arranged during her free time. Many patients have cause to be grateful to Dr. England for her enthusiasm and interest in her work and for the sacrifice of her leisure time.

As a working colleague Dr. England was always bright and cheerful, ready to enjoy and exchange a joke. Those of us who were privileged to work with her and enjoy her friendship mourn her loss.

Post-Graduate Work.

THE POST-GRADUATE COMMITTEE IN MEDICINE IN THE UNIVERSITY OF SYDNEY.

Post-Graduate Conference at Parramatta.

THE Post-Graduate Committee in Medicine at the University of Sydney announces that, in conjunction with the Central Western Medical Association, a post-graduate conference will be held in the nurses' lecture room, Parramatta District Hospital, on Saturday and Sunday, October 19 and 20, 1957. The programme is as follows:

Saturday, October 19: 2 p.m., registration; 2.30 p.m., "Modern Trends in Paediatrics", Dr. D. G. Hamilton; 4 p.m., question time, Dr. D. G. Hamilton.

Sunday, October 20: 10 a.m., "The Surgery of Vascular Disease", Dr. F. H. Mills; 11.30 a.m., "Some New Drugs in Use in General Practice", Dr. F. H. Hales Wilson; 2 p.m., "The Prevention of Rheumatic Cardiac Disease", Dr. Hales Wilson; 2.20 p.m., "Surgery of Rheumatic Heart Disease", Dr. F. H. Mills; 2.40 p.m., quiz session, Dr. Hales Wilson and Dr. F. H. Mills.

The fee for attendance at the course is £3 3s., and those wishing to attend are requested to notify Dr. C. A. McDermott, Carlton Street, Granville, as soon as possible. Telephone: YU 1570.

THE MELBOURNE MEDICAL POST-GRADUATE COMMITTEE.

Programme for October, 1957.

SIR RUSSELL BROCK, M.S., F.R.C.S., of Guy's Hospital, London, who will be visiting the Royal Melbourne Hospital and the Alfred Hospital in October, 1957, will lecture for the Melbourne Medical Post-Graduate Committee at 8.15 p.m. on Thursday, October 17, at the Medical Society Hall, on "Principles in the Differential Diagnosis of Lung Disease". The fee for this lecture is 15s., but those who have paid an annual subscription to the Committee are invited to attend without further charge.

Sir Geoffrey Jefferson, C.B.E., F.R.S., M.S., F.R.C.S., F.R.C.P., Director of the Neurological Laboratories, University of Manchester, is en route to Australia. It is now expected that he will lecture for this Committee in October. An announcement will be made as soon as possible.

A lecture will be given at Flinders Naval Depot on Wednesday, October 2, at 2.30 p.m.; Mr. R. Newing will talk on "The Modern Treatment of Burns". This lecture is to be given by arrangement with the Royal Australian Navy.

Courses in 1958.

The Committee is anxious to ascertain the demand for refresher courses to be conducted early in 1958, in gynaecology and obstetrics and/or paediatrics, more particularly for recent graduates. Those interested are asked to get into touch with the Committee within the next week or two. A summary of all courses proposed for 1958 will be published at the end of October.

Information.

The address of the Melbourne Medical Post-Graduate Committee is 394 Albert Street, East Melbourne, C.2. Telephone: FB 2547.

FULBRIGHT TRAVEL COMPETITIONS, 1958-1959.

THE United States Educational Foundation in Australia announces that competitions for Fulbright travel grants tenable for the American academic year 1958-1959 are now open and applications are being accepted in three different categories, as follows:

Visiting Lecturers or Research Scholars.—Lecturers must have received an invitation to lecture at an approved American institution and must intend spending a minimum of one semester in the United States. Research scholars must be undertaking advanced research, and the minimum duration of their stay should be three months. Both visiting lecturers and research scholars are required to spend two-thirds of their stay in the United States at their host institutions. The closing date of the competition is January 31, 1958.

Post-Graduate Students.—Persons applying in this competition must intend pursuing a course of post-graduate study at an American institution of higher learning for an academic year. Doctors taking up intern and resident positions are also eligible to apply. The closing date of the competition is February 28, 1958.

Special Categories.—Lecturers, Research Scholars and Students.—A small number of grants has been set aside for persons whose professions do not require highly specialized academic qualifications. The closing date of the competition is April 30, 1958.

Information.

Further information and application forms may be obtained from the United States Educational Foundation in Australia, Box 89, G.P.O., Canberra, A.C.T.

Naval, Military and Air Force.

APPOINTMENTS.

THE following appointments, changes, etc., have been promulgated in the *Commonwealth of Australia Gazette*, No. 45, of August 15, 1957.

AUSTRALIAN MILITARY FORCES.

Australian Regular Army.

Royal Australian Army Medical Corps (Medical).—The Short Service Commission granted to 3/40054 Captain (Temporary Major) J. H. Cater is extended until 23rd September, 1957.

Citizen Military Forces.

Northern Command.

Royal Australian Army Medical Corps (Medical).—1/61806 Lieutenant-Colonel M. R. Gold relinquishes command 9th Field Ambulance, 19th May, 1957, and is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Northern Command), 20th May, 1957. 1/39083 Captain R. Cantamessa ceases to be seconded whilst undergoing post-graduate studies in the United Kingdom, 5th June, 1957.

Eastern Command.

Royal Australian Army Medical Corps (Medical).—2/221713 Major D. C. Williams is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Eastern Command), 15th May, 1957. 2/766388 Captain (provisionally) A. R. Buhagiar relinquishes the provisional rank of Captain, 23rd May, 1957, and is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Eastern Command) in the honorary rank of Captain, 24th May, 1957. 2/206953 Lieutenant-Colonel T. M. Greenaway is placed upon the Retired List (Eastern Command) with permission to retain his rank and wear the prescribed uniform, 2nd June, 1957. To be Lieutenant-

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED AUGUST 24, 1957.¹

Disease.	New South Wales.	Victoria.	Queensland.	South ² Australia.	Western Australia.	Tasmania.	Northern Territory.	Australian Capital Territory.	Australia. ³
Acute Rheumatism	5(5)	2(2)	..	..	..	..	..	7
Amoebiasis	2	..	..	..	1	..	3
Ancylostomiasis	17(1)	..	..	..	..	..	17
Anthrax
Bilharziasis
Brucellosis
Cholera
Chorea (St. Vitus)	1(1)	..	..	..	..	..	1
Dengue
Diarrhoea (Infantile)	1	8(8)	..	..	..	..	1	..	10
Diphtheria	1	1(1)	..	..	1(1)	..	..	..	3
Dysentery (Bacillary)	1	..	..	..	1
Encephalitis	2	..	..	..	..	..	..	..	2
Filariasis
Homologous Serum Jaundice
Hydatid
Infective Hepatitis	51(16)	25(11)	..	..	6(2)	2(1)	..	..	84
Lead Poisoning
Leprosy	3	..	..	..	..	..	3
Leptospirosis	2	..	..	..	..	1	3
Malaria	2(1)	..	..	9
Meningococcal Infection	1(1)	5(4)	1	..	..	..	..	..	..
Ophthalmia
Ornithosis
Paratyphoid
Plague
Pollomyelitis
Puerperal Fever	1	..	..	..	..	..	1
Rubella	44(20)	..	..	5(5)	..	..	1	50
Salmonella Infection
Scarlet Fever	15(10)	16(12)	4(1)	..	3(3)	1	..	..	30
Smallpox	1	..	..	..	..	..	..
Tetanus	718(60)	..	10	..	723
Trachoma
Trichinosis
Tuberculosis	47(27)	18(14)	..	..	4(4)	4	3	..	76
Typhoid Fever
Typhus (Flea-, Mite- and Tick-borne)	1	..	..	..	1	..	2
Typhus (Louse-borne)
Yellow Fever

¹ Figures in parentheses are those for the metropolitan area.

² Figures not available.

³ Figures incomplete owing to absence of returns from South Australia.

Colonel, 15th June, 1954—2/206953 Major (Temporary Lieutenant-Colonel) T. M. Greenaway.

Southern Command.

Royal Australian Army Medical Corps (Medical).—3/50012 Lieutenant-Colonel J. C. Stewart is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Southern Command), 7th June, 1957. The provisional appointment of 3/139406 Captain M. R. Barrett is terminated, 6th June, 1957. To be Captain (provisionally), 7th June, 1957—3/139406 Michael Rupert Barrett.

Reserve Citizen Military Forces.

Royal Australian Army Medical Corps (Medical).

Northern Command.—To Be Honorary Captains—Kenneth John McIntyre, 14th June, 1957, and Edgar Moo, 17th June, 1957.

The following officers are placed upon the Retired List with permission to retain their rank and wear the prescribed uniform, 30th June, 1957:—

Northern Command.—Major (Honorary Lieutenant-Colonel) A. D. A. Mayes, Majors J. A. Lynch, A. V. G. Price, A. F. Quale, and J. H. Simmonds, and Captains G. A. Bolton, M. J. Hishon, H. C. Murphy, H. C. Wakefield, and M. G. Wilson.

Eastern Command.—Lieutenant-Colonel J. Davis and Captain C. G. Champion.

Southern Command.—Major I. A. M. Le Souef.

Tasmania Command.—Major J. B. Hamilton.

The following officers are retired:—

Northern Command.—Honorary Major A. D. D. Pye, and Honorary Captains R. V. Adamson, M. J. Eakin, J. A. Emmett, A. M. Martell, and M. L. Unwin, 30th June, 1957.

Southern Command.—Honorary Captains J. W. Ainslie and C. N. L. Cantor, 30th June, 1957, and E. G. Dahlenburg, 31st July, 1957.

Tasmania Command.—Honorary Captains F. Phillips and E. B. Tunbridge, 30th June, 1957.—(Ex. Min. No. 80—Approved 7th August, 1957).

ROYAL AUSTRALIAN AIR FORCE.

Permanent Air Force.

Medical Branch.

Keith Reginald Fisher (0218481) is appointed to a short-service commission, on probation for a period of twelve months, 3rd June, 1957, with the rank of Flight Lieutenant.

The resignation of Flight Lieutenant G. C. Fisk (0310757) is accepted, 24th May, 1957.

Active Citizen Air Force.

Medical Branch.

No. 21 (*City of Melbourne*) Squadron.—Flight Lieutenant J. E. H. Milne (0311677) is transferred to the Reserve, 16th July, 1956.

No. 24 (*City of Adelaide*) Squadron.—Flight Lieutenant D. S. Forbes (042994) is transferred from the Reserve, 1st October, 1956. Flight Lieutenant (Acting Squadron Leader) C. D. Swaine (041135) relinquishes the acting rank of Squadron Leader and is transferred to the Reserve, 7th August, 1956.

No. 25 (*City of Perth*) Squadron.—Flight Lieutenant J. R. H. Watson (051362) is transferred to the Reserve, 22nd March, 1956.

Sydney University Squadron.—Pilot Officer S. B. Renwick (0212634) is transferred from the Reserve, 10th May, 1956.

Adelaide University Squadron.—Flight Lieutenant C. J. Schwartz (042995) is transferred from the Reserve, 5th March, 1957. Pilot Officer L. S. Coats (04783) is promoted to the rank of Flight Lieutenant, 28th November, 1956. Pilot Officer E. W. Knight (052512) is granted the acting rank of Flying Officer, 22nd September, 1956.

Nominations and Elections.

THE undermentioned has applied for election as a member of the New South Wales Branch of the British Medical Association:

Clayton, Maxwell Richmond, M.B., B.S., 1954 (Univ. Sydney), 6 Military Road, Merrylands, New South Wales.

DEATH OF DR. MERVYN ARCHDALL.

DR. MERVYN ARCHDALL died in his sleep on the evening of Friday, September 6. This was after the printing of the editorial pages of this issue, in which are announced the award to him of the Gold Medal of the British Medical Association in Australia and his appointment as Consultant Editor of the Journal. A full editorial reference will be made in the next issue.

Deaths.

The following deaths have been announced:

SPRING.—James Francis Spring, on August 23, 1947, at Melbourne.

CHENHALL.—Noel Chenhall, on September 1, 1957, at Melbourne.

Diary for the Month.

SEPT. 14.—Queensland Branch, B.M.A.: Annual General Meeting.

SEPT. 16.—Victorian Branch, B.M.A.: Finance Subcommittee.

SEPT. 17.—New South Wales Branch, B.M.A.: Medical Politics Committee.

SEPT. 18.—Western Australian Branch, B.M.A.: General Meeting.

SEPT. 18.—Victorian Branch, B.M.A.: Clinical Meeting.

SEPT. 19.—New South Wales Branch, B.M.A.: Clinical Meeting.

SEPT. 19.—Victorian Branch, B.M.A.: Executive of Branch Council.

SEPT. 24.—New South Wales Branch, B.M.A.: Ethics Committee.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch. (Medical Secretary, 135 Macquarie Street, Sydney): All contract practice appointments in New South Wales.

Queensland Branch. (Honorary Secretary, 88 L'Estrange Terrace, Kelvin Grove, Brisbane, W.1): All applicants for Queensland State Government Insurance Office positions are advised to communicate with the Honorary Secretary.

South Australian Branch. (Honorary Secretary, 80 Brougham Place, North Adelaide): All contract practice appointments in South Australia.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2-3.)

Members and subscribers are requested to notify the Manager, THE MEDICAL JOURNAL OF AUSTRALIA, Seamer Street, Glebe, New South Wales, without delay, of any irregularity in the delivery of this journal. The management cannot accept any responsibility or recognize any claim arising out of non-receipt of journals unless such notification is received within one month.

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